

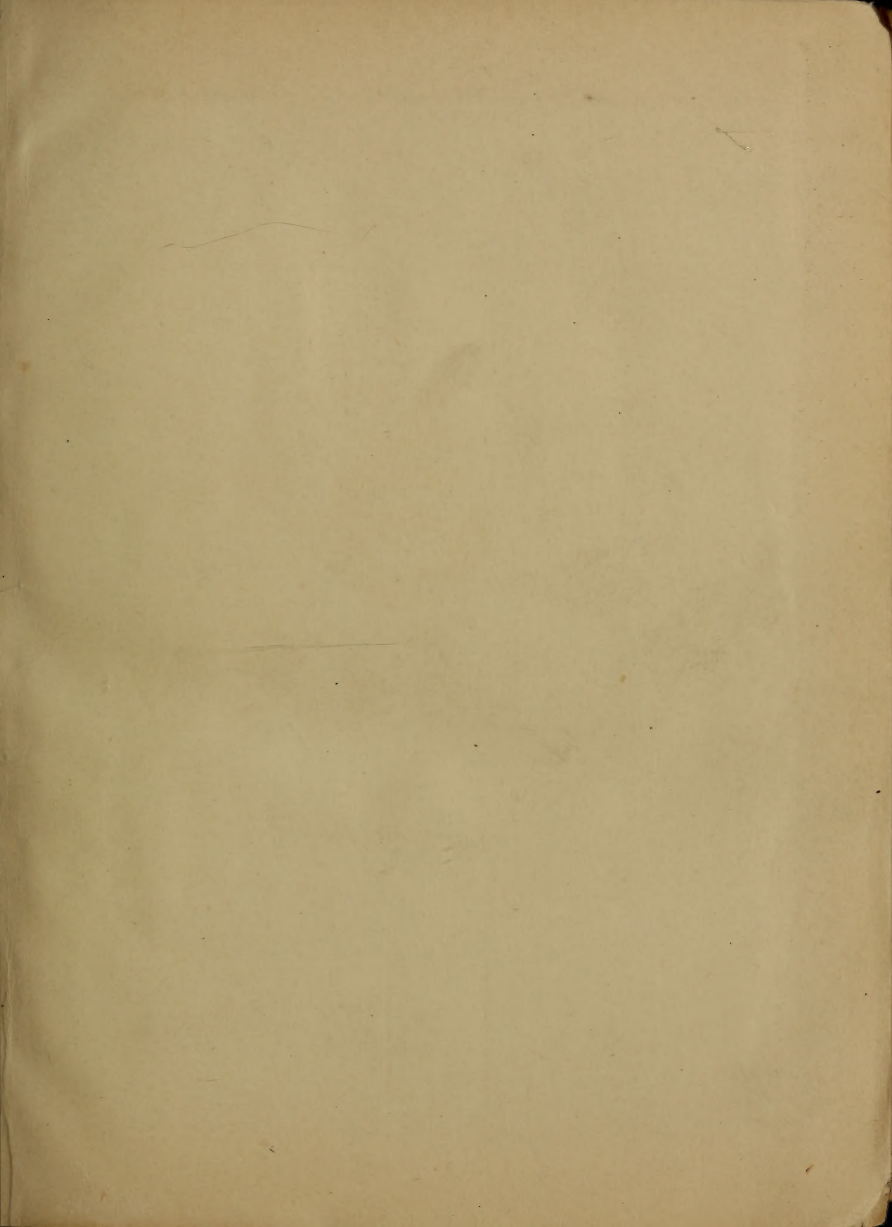
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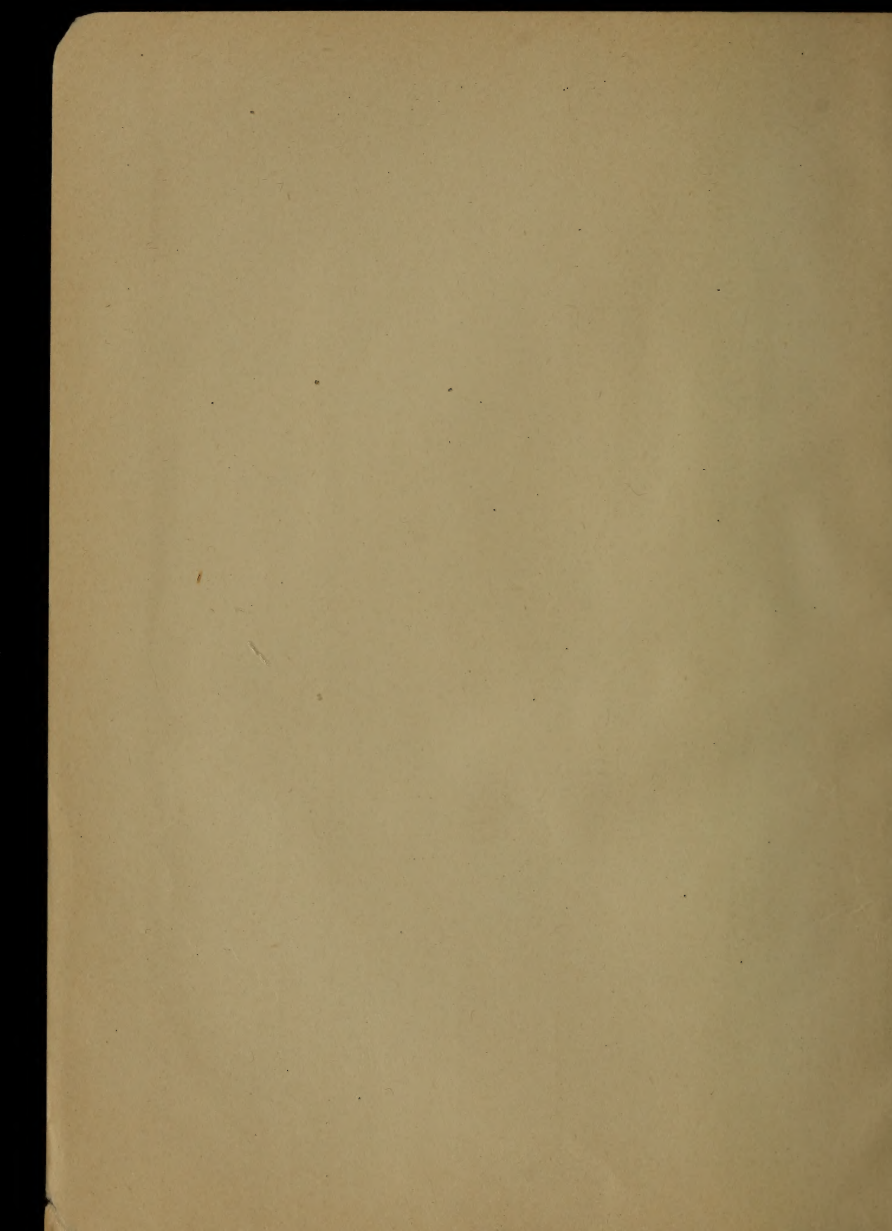
Book C89

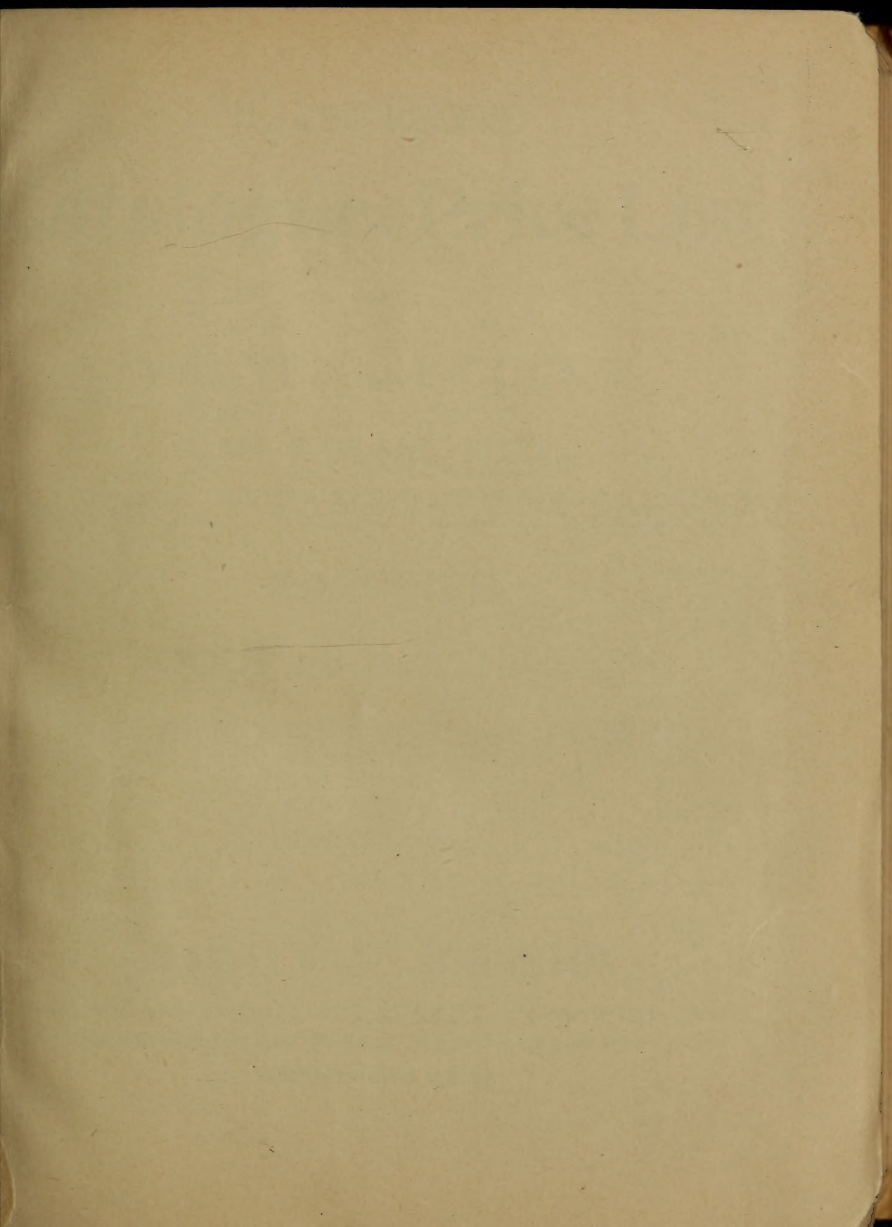
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12

ILLUSTRATED

# Catalogue & Price List

----- OF -----

VALVES and COCKS

590  
115

GAS, STEAM, MILL,  
FACTORY, STEAMBOAT AND RAILWAY

**SUPPLIES**

TOOLS and MACHINERY

BOILERS, ENGINES and PUMPS.

\*\*\*\*\*  
JANUARY, 1902.  
\*\*\*\*\*

**CRAWLEY & JOHNSTON,**

SALESROOM AND OFFICE: 522 MAIN ST., OPPOSITE POST OFFICE.

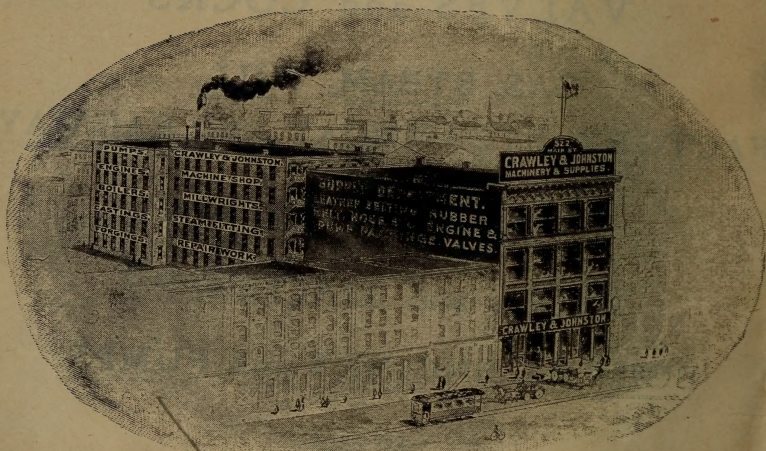
FACTORY AND WAREHOUSE: IN REAR, FRONTING ON LANGDON COURT.

CINCINNATI, OHIO.

PHONES: { Main, 1491.  
1851.

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TJ 1175  
.C89



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## SPECIAL NOTICE.

.....

TO FACILITATE BUSINESS AND SAVE CORRESPONDENCE, WE BEG TO CALL THE  
ATTENTION OF OUR CUSTOMERS TO THE FOLLOWING POINTS.

.....

This Catalogue supersedes all of previous issue.

Prices are subject to change without notice.

*In ordering, please refer to the Catalogue, Page, and name of article.*

Full shipping instructions, and complete specifications whenever any change from regular goods is required, should accompany each order. Where no instructions are given, all goods will be made in the regular way, and shipped by the most expeditious route.

Boxing and crating, when required, will be charged for at cost, except when furnished free by the manufacturers.

Insurance will not be placed on domestic shipments, unless requested. On foreign shipments, the insurance will be effected by us, unless we are advised to the contrary.

Our responsibility as shippers ceases upon delivery of goods at railway station or wharf, and transportation company's receipt obtained for same in good condition.

We must insist that customers confer with us before returning any goods apparently erroneously shipped them, and unless permission is obtained from us, the party returning will in all cases, pay freight and expenses, and be responsible for any damage to the goods until received by us.

Our terms are **net cash** in thirty days, unless otherwise agreed.

Correspondence relating to business, to secure prompt attention, must in all cases be addressed direct to the house, and not to individuals.

**CRAWLEY & JOHNSTON.**



# Your Machinery and Supply House.



There are many things about the Machinery and Supply business which require years of learning.

Our experience in this line, together with our engineering and machine shop experience, place us in position to know all about the goods we sell.

You can not be expected to know much about all of the different lines of goods pertaining to the general supply business.

We are exerting every energy toward running this business as you would like to see it run.

We study the wants of our customers, and the requirements for all conditions.

It is a pleasure to patronize a place with whom you can consult and feel assured that you are receiving the benefit of ideas of practical people who are experts in the business.

In addition to our personal experience, we have surrounded ourselves with men who are experts in their particular line.

To deserve and get your entire confidence when it comes to a matter of engineering work, machine work or supplies, is our ambition.

We want you to give us your confidence, and this point given, we know we can depend on your wants being supplied at our store.

Our rapidly increasing general business, and especially that our Supply business, is showing remarkable gains, is proof that an earnest, honest, intelligent effort is sure of prompt reward.



**TAKE-UPS.**

For Use where it is Necessary to Take Up Slack in Belts as in Elevators.

Made to Pull and Push.

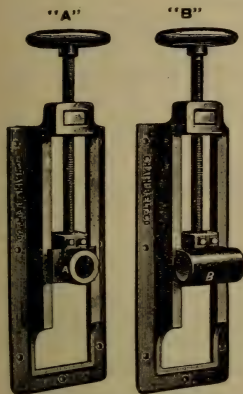


Fig. 2057.

Fig. 2058.

**PRICE LIST AND DIMENSIONS.**

No. of Frame.	Diameter of Shaft.	Price Each "A" or "B"	No. of Frame	Diameter of Shaft.	Price Each "A" or "B"
4	1 1/16	1.75	12	2 7/16	6.75
4	1 3/16	1.90	20	2 9/16	9.50
4	1 5/16	2.00	20	2 11/16	10.00
5	1 3/8	2.55	20	2 13/16	11.00
5	1 5/8	2.70	20	2 3/4	13.50
7	1 7/8	3.25	24	3 1/8	15.00
7	1 9/8	3.50	36	3 15/16	20.00
7	1 11/8	4.00	48	3 5/8	35.00
9	1 15/8	4.75	60	3 7/8	40.00
9	2 3/8	5.00	72	4 1/8	50.00
12	2 5/8	6.25			

In ordering, give diameter of shaft.

The number of Frame indicates length of movement in inches.

**SPROCKET WHEELS.**

FOR REGULAR CHAIN LIST.

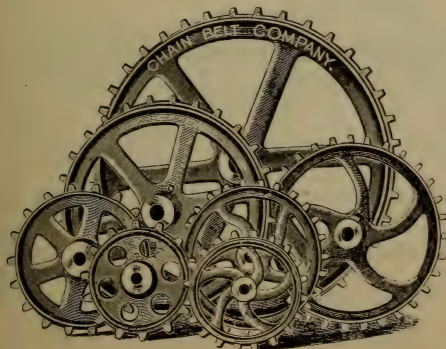


Fig. 2059.

**All our Sprocket Wheels  
Work in Either Direction.**

Additional price to be added to list price for Split Sprockets, Square or Jaw Clutch Sprockets, Sprockets with extra large hubs or hubs one side only, and for all Sprockets bored larger than four inches.

In some cases several numbers of chain belting run on same wheels, as 35, 45, and 55, or 57, 67, and 77, or 75, 78, and 88.

In ordering give the diameter of the wheel and the number of teeth and exact size of bore, and say whether set screws or key way. We charge extra for both set screws and key seat.

For Sizes and Prices, see Next Pages.

# PRICE LIST OF SPROCKET WHEELS.

Bored and Key-Seated or Set-Screwed.

In Ordering State Which.

No. 25.				No. 32.				Nos. 35, 45, 55.				No. 51.				Nos. 57, 67, 77.				No. 62.				Nos. 75, 78, 88.			
Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.		Pitch Diam. Ins.	No. of Teeth.	Price.	
2	7	\$0.80		16	44	\$3.30		14½	27	\$ 3.30		1¾	5	\$0.90		4½	5	\$1.35		4¾	8	\$1.40		5	6	\$1.65	
2½	8	.85		16	44	3.40		16	31	3.70		2½	7	1.00		4½	6	1.45		5	11	1.50		6	7	1.80	
3	9	.90		18½	35	4.20		18½	35	4.20		3	8	1.15		4½	7	1.55		5½	11	1.70		6½	8	2.00	
3½	11	1.00		20½	39	4.65		20½	39	4.65		4	11	1.25		5½	6	1.70		7½	14	2.00		7½	9	2.20	
4	12	1.05		21¾	42	5.00		21¾	42	5.00		4½	12	1.35		6¾	8	1.85		8	15	2.10		8½	10	2.40	
4½	13	1.10		23½	45	5.40		23½	45	5.40		5	14	1.40		7½	10	2.00		8½	15	2.10		9	11	2.60	
5	14	1.15		28	54	7.00		28	54	7.00		6¼	17	1.60		8	11	2.15		9½	18	2.25		10	12	2.80	
5½	15	1.20		36	69	10.50		36	69	10.50		8	22	2.00		8½	12	2.30		10½	20	2.75		10½	13	3.00	
6	16	1.25		42	82	14.00		42	82	14.00		10	27	2.35		9½	13	2.50		11½	22	3.03		11½	14	3.20	
6½	17	1.30		No. 42.				12	33	3.20		11	15	2.85		12	17	3.25		12½	23	3.20		12½	15	3.40	
7	18	1.35						14	39	3.70		12½	17	3.25		13	19	3.65		14½	28	3.95		14½	17	3.90	
7½	19	1.40						16	45	4.10		14	19	3.65		14½	20	3.85		16	30	4.25		16	19	4.40	
8	20	1.45						18½	50	4.50		15½	21	4.05		15½	21	4.05		18	34	4.85		18½	22	4.65	
8½	21	1.50		No. 52.				19	54	4.40		16½	22	4.25		16½	22	4.25		20	43	6.20		20	24	5.65	
9	22	1.55						22	60	4.80		17	23	4.50		17	23	4.50		23	44	6.50		21	25	5.90	
9½	23	1.60						24	66	5.20		18½	25	5.00		18½	25	5.00		24	45	7.50		22½	27	6.40	
10	24	1.65						26	72	5.60		19½	27	5.50		19½	27	5.50		30½	58	9.00		24	29	6.90	
10½	25	1.70		Nos. 35, 45, 55.				28	78	6.00		20	28	5.75		20	28	5.75		No. 66.				24½	30	7.15	
11	26	1.75						30	84	6.40		21	30	6.25		21	30	6.25						28½	34	8.55	
11½	27	1.80						32	90	6.80		22	33	6.50		22	33	6.50						29½	35	8.90	
12	28	1.85						34	96	7.20		23	36	6.75		23	36	6.75						30½	37	10.00	
12½	29	1.90		2½	6	\$0.90		2½	6	1.00		7½	12	\$2.00		7½	12	\$2.00		7½	12	\$2.00		32½	39	10.90	
13	30	1.95		3	7	1.10		3	7	1.20		8½	13	2.25		8½	13	2.25		8½	13	2.25		32½	40	11.40	
13½	31	2.00		3½	8	1.15		3½	8	1.25		9	14	1.75		9	14	1.75		10½	16	2.60		33½	41	12.40	
14	32	2.05		4	9	1.20		4	9	1.30		10	15	1.85		10	15	1.85		12½	19	3.10		37	44	12.80	
14½	33	2.10		4½	10	1.25		4½	10	1.35		11	16	1.95		11	16	1.95		16½	25	4.25		38	46	14.00	
15	34	2.15		5	11	1.30		5	11	1.40		12	17	2.05		12	17	2.05		No. 83.				42	49	16.50	
15½	35	2.20		5½	12	1.35		5½	12	1.45		13	18	2.10		13	18	2.10						44	51	17.50	
16	36	2.25		6	13	1.40		6	13	1.50		14	19	2.20		14	19	2.20						46	53	18.50	
16½	37	2.30		6½	14	1.45		6½	14	1.55		15	20	2.30		15	20	2.30						48	55	19.50	
17	38	2.35		7	15	1.50		7	15	1.60		16	21	2.40		16	21	2.40		All Double Teeth.				50	57	20.50	
17½	39	2.40		7½	16	1.55		7½	16	1.65		17	22	2.50		17	22	2.50						52	59	21.50	
18	40	2.45		8	17	1.60		8	17	1.70		18	23	2.60		18	23	2.60						54	61	22.50	
18½	41	2.50		8½	18	1.65		8½	18	1.75		19	24	2.70		19	24	2.70						56	63	23.50	
19	42	2.55		9	19	1.70		9	19	1.80		20	25	2.80		20	25	2.80		No. 83.				58	65	24.50	
19½	43	2.60		9½	20	1.75		9½	20	1.85		21	26	2.90		21	26	2.90						60	67	25.50	
20	44	2.65		10	21	1.80		10	21	1.90		22	27	3.00		22	27	3.00						62	69	26.50	
20½	45	2.70		10½	22	1.85		10½	22	1.95		23	28	3.10		23	28	3.10						64	71	27.50	
21	46	2.75		11	22	1.90		11	22	2.00		24	29	3.20		24	29	3.20		All Double Teeth.				66	73	28.50	
21½	47	2.80		11½	23	1.95		11½	23	2.05		25	30	3.30		25	30	3.30						68	75	29.50	
22	48	2.85		12	23	2.00		12	23	2.10		26	31	3.40		26	31	3.40						70	77	30.50	
22½	49	2.90		12½	24	2.05		12½	24	2.15		27	32	3.50		27	32	3.50						72	79	31.50	
23	50	2.95		13	24	2.10		13	24	2.20		28	33	3.60		28	33	3.60		No. 83.				74	81	32.50	
23½	51	3.00		13½	25	2.15		13½	25	2.25		29	34	3.70		29	34	3.70						76	83	33.50	
24	52	3.05		14	25	2.20		14	25	2.30		30	35	3.80		30	35	3.80						78	85	34.50	
24½	53	3.10		14½	26	2.25		14½	26	2.35		31	36	3.90		31	36	3.90						80	87	35.50	
25	54	3.15		15	26	2.30		15	26	2.40		32	37	4.00		32	37	4.00		All Double Teeth.				82	89	36.50	
25½	55	3.20		15½	27	2.35		15½	27	2.45		33	38	4.10		33	38	4.10						84	91	37.50	
26	56	3.25		16	27	2.40		16	27	2.50		34	39	4.20		34	39	4.20						86	93	38.50	
26½	57	3.30		16½	28	2.45		16½	28	2.55		35	40	4.30		35	40	4.30						88	95	39.50	
27	58	3.35		17	28	2.50		17	28	2.60		36	41	4.40		36	41	4.40		No. 83.				90	97	40.50	
27½	59	3.40		17½	29	2.55		17½	29	2.65		37	42	4.50		37	42	4.50						92	99	41.50	
28	60	3.45		18	29	2.60		18	29	2.70		38	43	4.60		38	43	4.60						94	101	42.50	
28½	61	3.50		18½	30	2.65		18½	30	2.75		39	44	4.70		39	44	4.70						96	103	43.50	
29	62	3.55		19	30	2.70		19	30	2.80		40	45	4.80		40	45	4.80		All Double Teeth.				98	105	44.50	
29½	63	3.60		19½	31	2.75		19½	31	2.85		41	46	4.90		41	46	4.90						100	107	45.50	
30	64	3.65		20	31	2.80		20	31	2.90		42	47	5.00		42	47	5.00						102	109	46.50	
30½	65	3.70		20½	32	2.85		20½	32	2.95		43	48	5.10		43	48	5.10						104	111	47.50	
31	66	3.75		21	32	2.90		21	32	3.00		44	49	5.20		44	49	5.20		No. 83.				106	113	48.50	
31½	67	3.80		21½	33	2.95		21½	33	3.05		45	50	5.30		45	50	5.30						108	115	49.50	
32	68	3.85		22	33	3.00		22	33	3.10		46	51	5.40		46	51	5.40						110	117	50.50	
32½	69	3.90		22½	34	3.05		22½	34	3.15		47	52	5.50		47	52	5.50						112	119	51.50	
33	70	3.95		23	34	3.10		23	34	3.20		48	53	5.60		48	53	5.60		All Double Teeth.				114	121	52.50	
33½	71	4.00		23½	35	3.15		23½	35	3.25		49	54	5.70		49	54	5.70						116	123	53.50	
34	72	4.05		24	35	3.20		24	35	3.30		50	55	5.80		50	55	5.80						118	125	54.50	
34½	73	4.10		24½	36	3.25		24½	36	3.35		51	56	5.90		51	56	5.90						120	127	55.50	
35	74	4.15		25	36	3.30		25	36	3.40		52	57	6.00		52	57	6.00		No. 83.				122	129	56.50	
35½	75	4.20		25½	37	3.35		25½	37	3.45		53	58	6.10		53	58	6.10						124	131	57.50	
36	76	4.25		26	37	3.40		26	37	3.50																	

### PRICE LIST OF SPROCKET WHEELS.—Continued.

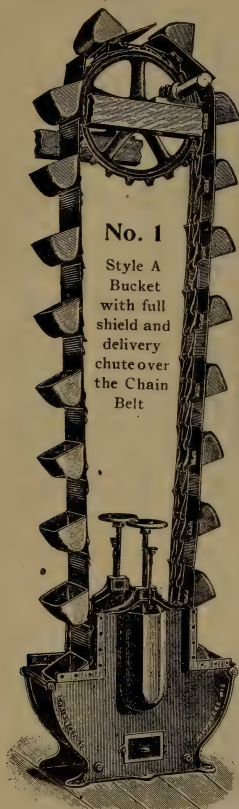
**Bored and Key-Seated or Set-Screwed.**

**In Ordering State Which.**

[illegible]

In ordering be sure to give the diameter and the number of teeth and size of bore, and if they are to be set-screwed or key-seated. Be sure and state the number of teeth in the wheel.

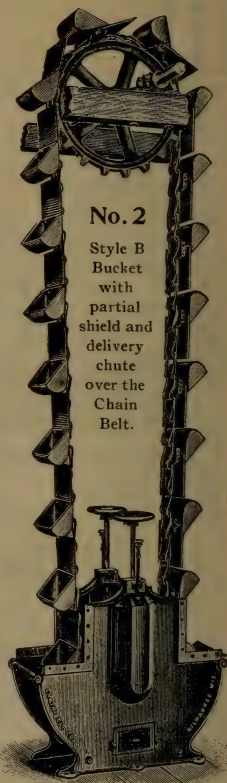
## PERFECT DISCHARGE ELEVATORS.

**No. 1**

Style A  
Bucket  
with full  
shield and  
delivery  
chute over  
the Chain  
Belt

The two elevators shown by these cuts are constructed with our adjustable plates which form a chute at the top for perfect delivery. The elevators can be perpendicular or at any angle of elevation. The overlapping plates in No. 1 cover the entire chain belt and in No. 2 nearly cover it to prevent the incoming material from falling through the chain belt into the wheel at the intake. Style "A" or style "B" buckets can be used on either of them.

For No. 1 with the overlapping plates we make the top and bottom wheels as large diameter as possible to insure

**No. 2**

Style B  
Bucket  
with  
partial  
shield and  
delivery  
chute over  
the Chain  
Belt.

free and silent operation around the wheels. With No. 2 having the covering plates nearly abutting at the joints, we use any desirable diameter of wheels at top or bottom.

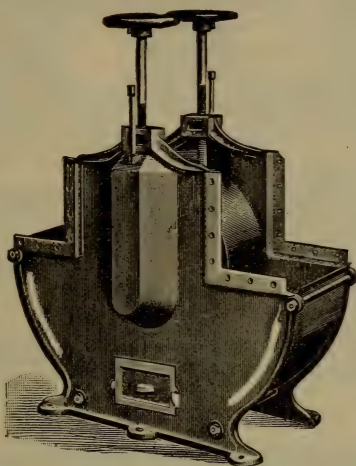
With this construction the elevator can be run very slowly and still secure a perfect discharge and is equally applicable to rapid speed. For coarse coal, broken stone, and any material where a slow or moderate speed is best and protection to the chain belt desirable, this construction surpasses any other. Attention is also called to the complete protection of the adjusting screws in the boot.



## CAST IRON ADJUSTABLE ELEVATOR BOOTS.



SINGLE STRAND.



DOUBLE STRAND.

The Boots are made of Cast Iron, and are supplied with adjustable boxes in connection with pulleys, oil tubes and tighteners, all as represented in cut.

## PRICE LIST OF BOOTS.

Size of Bucket.	Size of Pulley.	Price.	Size of Bucket.	Size of Pulley.	Price.
7x4½	14x 9	\$27.00	12x6	18x14	\$44.00
8x5	14x10	30.00	14x6	18x16	50.00
9x5	16x11	33.00	16x6	20x20	65.00
10x5½	16x12	37.00	18x6	22x22	85.00
11x6	18x13	40.00	20x6	24x24	95.00

Elevators and Conveyors of various kinds  
and for almost any purpose  
furnished to order at  
short notice.

## PRICE LIST OF Standard Detachable Chain Belt.

In Effect after June 26th, 1899. Subject to Change in List and Discount Without Notice.

~~DO NOT~~ DESTROY ALL PREVIOUS LISTS.

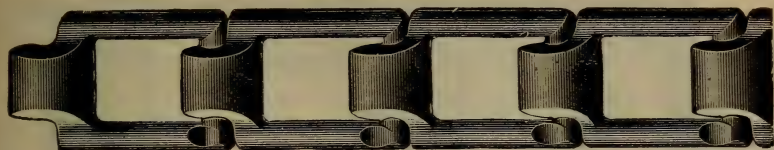
The numbers marked o. s. (odd sizes) are those for which sprockets wheels are not made except to special order.

All of our Chain Belt is made of the very best refined Malleable Iron. The links are drop hammered and accurately pitched to length and subjected to severe stationary and operative tests and proved to far higher speed than should ever be required in practical operation and finally are tested to fully double the working strain given in the list, to insure as perfect goods as it is possible to produce. It is not best to over strain chain belt in working, nor run it too fast.

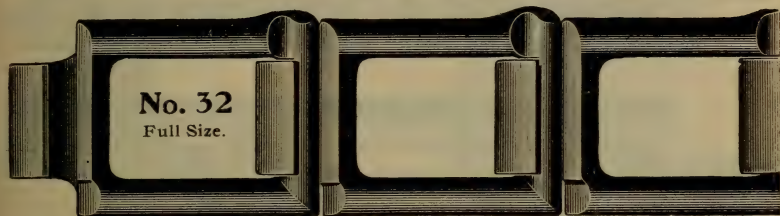
No.	PRICE PER FOOT.			Ap- proxi- mate Links in 10 Feet.	Maxi- mum Power in Pounds	No.	PRICE PER FOOT.			Ap- proxi- mate Links in 10 Feet.	Maxi- mum Power in Pounds
	All Plain Links.	All special Links.	With special Links Inter- persed				All Plain Links.	All special Links.	With special Links Inter- persed		
21	o.s. .20			192	80	67	.20	.34	.25	52	700
23	o.s. .15			185	65	71	.25			72	925
024	.13	.32	.20	133	50	71½	o.s. .23			60	900
25	.10	.23	.14	133	75	072	.23			72	900
025	o.s. .10	.23	.14	120	75	72	.23			59	850
32	.10	.21	.14	104	150	72½	.25			72	925
33	.10	.21	.14	86	200	75	.23	.37	.28	46	750
34	.10	.21	.14	86	225	75½	.25	.48	.28	51	750
35	.10	.21	.14	74	250	76	o.s. .23			52	625
36½	o.s. .11			80	250	76½	o.s. .23			58	700
.37	o.s. .11	.25	.18	60	225	77	.23	.37	.28	52	800
38	o.s. .11	.22	.15	60	250	77½	.31			52	1100
39	o.s. .25	.44	.32	77	300	78	.26	.47	.32	46	1000
042	.15	.25	.18	88	300	83	.31	.56	.44	30	1200
42	.11	.22	.15	88	300	85	.34	.56	.44	30	1300
43	o.s. .23	.38	.28	79	400	88	.31	.56	.44	46	1200
44	o.s. .11	.22	.15	80	325	89	o.s. .40			46	1300
45	.11	.22	.15	74	350	93	o.s. .37	.56	.47	30	1600
45½	.10	.20	.14	74	250	94	.50	.82	.64	30	1800
47	.13	.25	.18	74	400	95	.40	.75	.57	30	1600
48	o.s. .11	.22	.15	60	375	101	o.s. .40	.70	.57	45	1600
50	.14	.25	.18	87	350	103	.50	.75	.62	39	1800
51	.14	.25	.18	104	375	105	.44	.62	.53	20	1500
52	.15	.25	.18	80	500	106	o.s. .56			20	2000
052	.18			80	525	108	.50	.88	.69	25½	2000
52½	.20			79	550	114	.63	.80	.72	36½	2000
54	o.s. .15			82	475	115	o.s. .82			37	2050
055	.18			74	525	116½	o.s. .88			37	2100
55	.15	.23	.17	74	450	117	o.s. .82			37	2150
056	.19			80	600	118	o.s. .82			37	2200
057	.18	.30	.22	74	450	122	.75	1.15	.95	20	2200
57	.15	.30	.20	52	600	124	.75	1.25	1.00	30	2200
58	o.s. .18			75	550	130	o.s. 1.14			34	2500
62	.20	.34	.25	73	650	146	.75	1.15	.95	20	2800
64	o.s. .20			60	550	160	1.00	1.50	1.25	12	4000
164	.25			79	650	HHK1	o.s. .82			34	2100
65	o.s. .20	.34	.25	56	550	HHK2	o.s. 1.14			34	2500
66	.20	.34	.25	60	700	800	.65			29½	2000
503½	.13			94	200						

The above prices of Special Links are for A1, A2, A3, C1, E1, F2, G1, G6, H1, H2, K1, K2, M1, M3, R1, R3, S1 and S2, and as they are now made for the respective chains. Other Special Links will be furnished at special prices. Every size of Chain Belt in constant stock. Quick shipments.

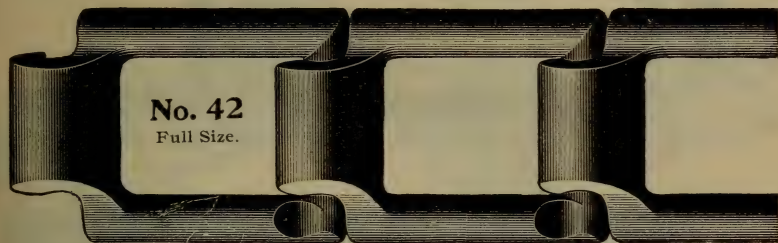
We have more than 1000 Patterns of Chain Belt.



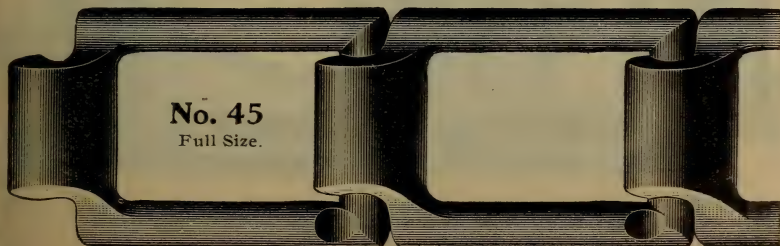
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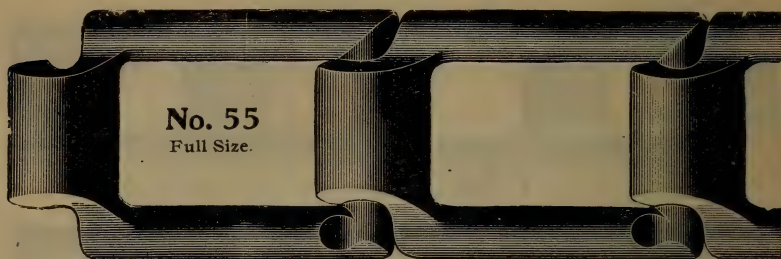
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Full Size.



**No. 42**  
Full Size.

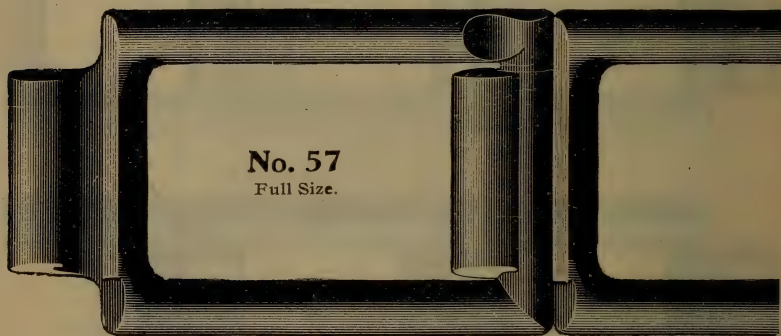


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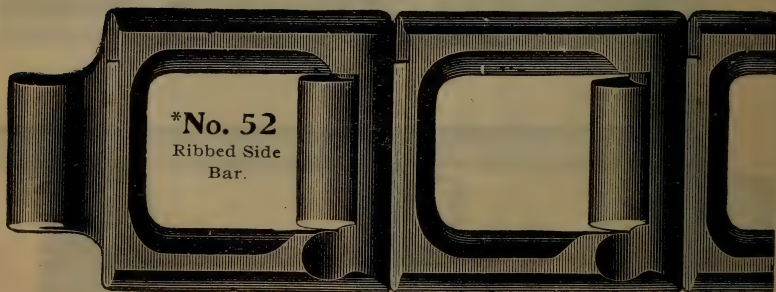
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Full Size.



**No. 57**

Full Size.

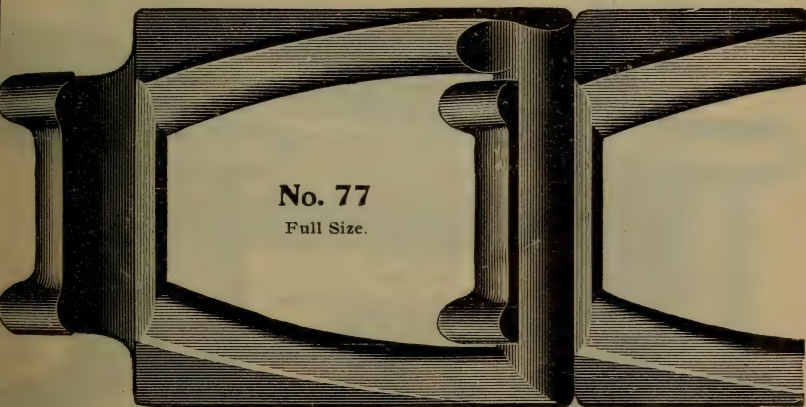


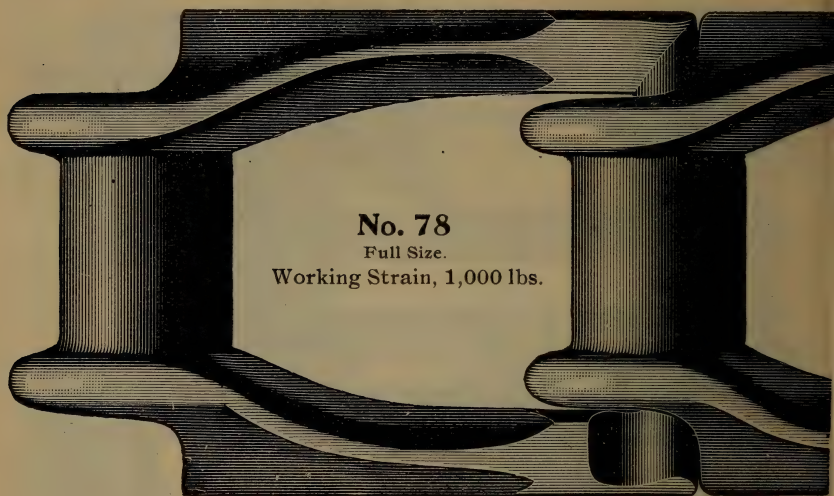
**\*No. 52**

Ribbed Side  
Bar.

\*No. 52 is made in two styles, round side bar and ribbed side bar; this cut shows the ribbed side bar, but the round side bar is equally strong and although a little lighter, is for many purposes preferable. Unless specified we send the ribbed side bar.



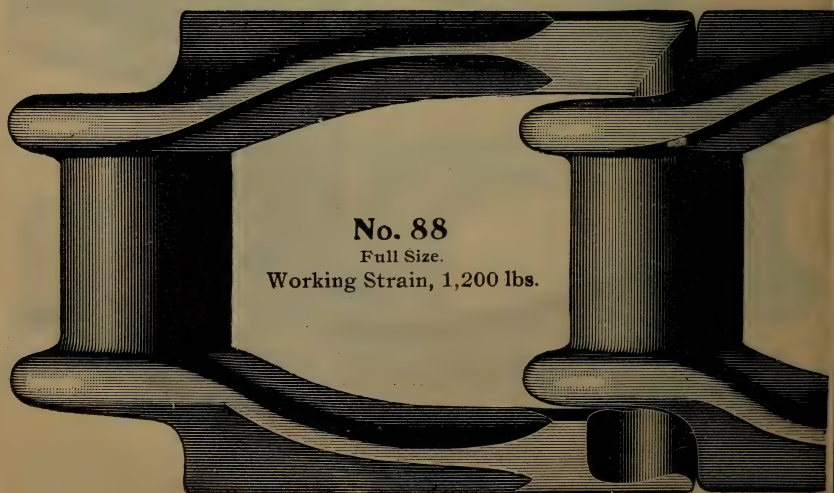




**No. 78**

Full Size.

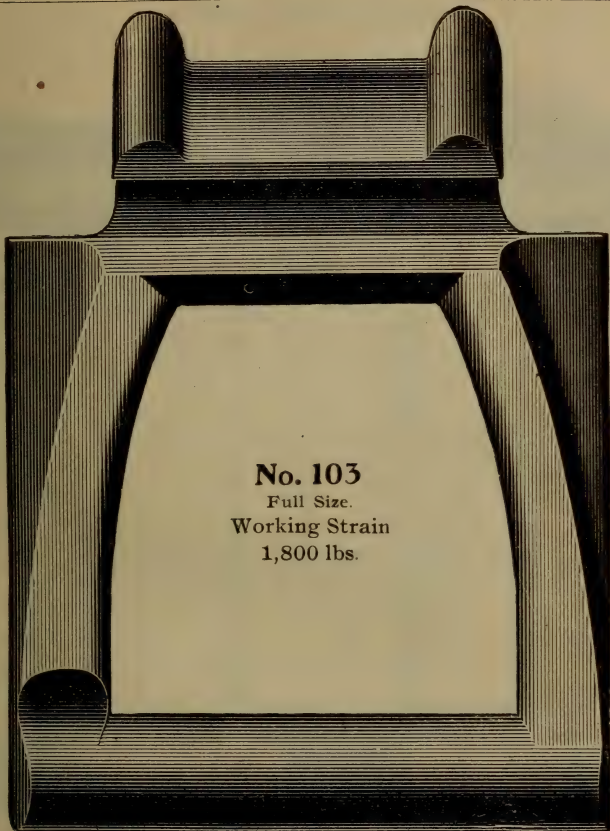
Working Strain, 1,000 lbs.



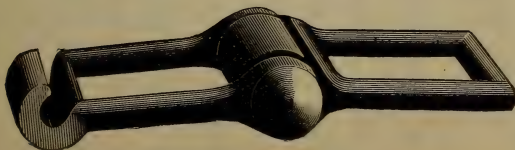
**No. 88**

Full Size.

Working Strain, 1,200 lbs.



**No. 103**  
Full Size.  
Working Strain  
1,800 lbs.



**CHAIN COUPLER.**

## SALEM ELEVATOR BUCKETS.

FOR GRAIN, ORE, COAL, STONE, AND HEAVY SUBSTANCES.



TOOTH EDGE.



"SALEM" STEEL BUCKETS.



PERFORATED.

Capacity—Bushels per hour 200 feet per min. 12 in. apart.		Size of Bucket		Regular Gauge Buckets for Mill and Elevator Work		Ear Corn and Similar Heavy Substances	
Width	Projection	Gauge No.	Price	Gauge No.	Price	Gauge No.	Price
21	2 x 2	14	\$0 35	10	\$0 04	No. 15	\$0 16
40	2 1/2 x 2 1/2	14	36	10	05	"	18
59	3 x 2 1/2	14	37	10	06	"	19
69	3 1/2 x 2 1/2	14	44	10	07	"	20
87	3 x 3	14	45	10	09	No. 16	28
102	3 1/2 x 3	14	46	10	10	"	29
116	4 x 3	14	48	10	12	"	30
131	4 1/2 x 3	14	54	10	13	"	31
159	4 x 3 1/2	14	66	10	14	"	33
179	4 1/2 x 3 1/2	14	70	10	18	"	34
199	5 x 3 1/2	14	88	10	19	"	35
229	5 x 4	14	90	10	20	"	39
251	5 1/2 x 4	14	94	10	30	"	40
274	6 x 4	14	45	10	41	"	41
500	7 x 4 1/2	14	46	10	43	"	49
670	8 x 5	14	54	10	54	"	59
754	10 x 5 1/2	14	62	10	62	"	63
873	10 x 6	14	65	10	65	"	76
1220	11 x 6	14	74	10	74	"	81
1342	12 x 6	14	89	10	89	"	85
1484	14 x 6	14	81	10	95	"	86
1708	16 x 6	14	88	10	80	"	97
1852	18 x 6	14	90	10	88	"	1 05
2186	20 x 6	14	98	10	98	"	1 13
2440	22 x 6	14	1 06	10	1 04	"	1 21
1590	10 x 7	14	1 15	10	1 12	"	1 01
1749	11 x 7	14	1 20	10	1 18	"	1 05
1908	12 x 7	14	1 26	10	1 22	"	1 09
2226	14 x 7	14	1 35	10	1 27	"	1 17
2544	16 x 7	14	1 43	10	1 31	"	1 25
2882	18 x 7	14	1 50	10	1 38	"	1 33
3180	20 x 7	14	2 02	10	1 41	"	1 41

Size of Bucket		Suitable for Ores, Coal, Broken Stone and Extra Heavy Substances.				
Width	Projection	Gauge No.	Price	Gauge No.	Price	Gauge No.
4 x 3 1/2	inch.	14	\$0 35	12	\$	8
4 1/2 x 3 1/2	"	14	36	10	04	6
5 x 3 1/2	"	14	37	10	05	6
5 x 4	"	14	44	10	06	6
5 1/2 x 4	"	14	45	10	07	6
6 x 4	"	14	46	10	09	6
7 x 4 1/2	"	14	54	10	12	6
8 x 5	"	14	66	10	13	6
9 x 5	"	14	70	10	14	6
10 x 5 1/2	"	14	88	10	18	6
10 x 6	"	14	90	10	19	6
11 x 6	"	14	94	10	20	6
12 x 6	"	14	98	10	30	6
14 x 6	"	14	1 06	10	41	6
16 x 6	"	14	1 15	10	43	6
18 x 6	"	14	1 25	10	54	6
20 x 6	"	14	1 35	10	62	6
10 x 7	"	14	1 10	10	65	6
11 x 7	"	14	1 15	10	74	6
12 x 7	"	14	1 20	10	89	6
14 x 7	"	14	1 30	10	95	6
16 x 7	"	14	1 40	10	80	6
18 x 7	"	14	1 50	10	88	6
20 x 7	"	14	2 02	10	98	6



## ELEVATOR BUCKETS.

Tin Mill Buckets.



As per lists below, the smaller sizes are made of Tin and the larger of smooth, refined Steel; the ends are double seamed to the body by special machinery, which enables us to produce a bucket which for strength and smoothness of finish has no superior.

They are guarded with band iron firmly riveted to the body, making the bucket light but firm; the shape is especially adapted to discharge readily.

Tin Mill Buckets.

Width on Belt	Projection	Price	Width on Belt	Projection	Price
2 x 2		\$0 06	4 x 3 1/2		\$0 12
2 1/2 x 2 1/2		07	4 1/2 x 3 1/2		13
3 x 3		08	5 x 4		15
3 1/2 x 3		09	5 1/2 x 4		16
4 x 3		11	6 x 4		17

Steel Grain Buckets.

Width on Belt	Projection	Price	Width on Belt	Projection	Price
5 x 4		\$0 15	11 x 6		\$0 33
5 1/2 x 4		16	12 x 6		36
6 x 4		17	14 x 6		42
7 x 4 1/2		21	16 x 6		50
8 x 5		25	18 x 6		60
9 x 5		27	20 x 6		65
10 x 5 1/2		30			

Table Showing Carrying Capacity of Steel Grain Buckets.

Size	12 in. apart. Speed 300 feet per min. No. of Bushels per Hour.	12 in. apart. Speed 500 feet per min. No. of Bushels per Hour.	12 in. apart. Speed 600 feet per min. No. of Bushels per Hour.
5 x 4	250	371	625
6 x 4	275	412	687
7 x 4 1/2	300	457	762
8 x 5	400	600	1000
9 x 5 1/2	450	675	1125
10 x 6	500	750	1250
11 x 6	550	825	1375
12 x 6	600	900	1500
14 x 6	800	1200	2000
20 x 6	1200	1800	3000

Malleable Iron Buckets.



STYLE A.



STYLE B.



STYLE C.

STYLE A.

Length	Width	Depth	Capacity Cubic Inches	Capacity Quarts	Price
4	2 1/2	2 1/2	13	.2	\$0 20
5	3 1/2	3	25	.4	35
6	4	3 1/2	50	.74	45
7	4 1/2	4	60	.86	55
8	5	4	108	1.6	65
10	6	5	160	2.37	90
12	5 1/2	5	280	4.	1 15
12	7	5 1/2	300	4.4	1 25
14	7	5 1/2	350	5.1	1 75
16	10	7	1175	17.5	4 00

STYLE B.

Length	Width	Depth	Capacity Cubic Inches	Capacity Quarts	Price
4	1 1/2	1	4		\$0 15
6	3 1/2	2 1/2	48	.7	50
10	4	3	60	.9	70
12	5 1/2	4	135	2.	90

STYLE C.

Length	Width	Depth	Capacity Cubic Inches	Capacity Quarts	Price
8	4 1/2	4	84	1.	\$0 50
10	5	4	120	1.5	70
12	5	4	144	2.	90
16	7	5 1/2	380	6.5	1 80

Steel Corn Buckets.



They are made similar to the Steel Grain Bucket, but of extra heavy material, and for the work for which they are intended they have no superior.

Across Belt	Projection	Number of Bolt Holes	Capacity	List Price
7 x 5		3	1 1/2 Quarts	\$0 27
8 x 5 1/2		3	2 "	30
9 x 6		3	2 1/2 "	33
10 x 6		3	3 "	36
11 x 7		4	3 1/2 "	44
12 x 7		4	4 "	48
13 x 7		4	4 1/2 "	52
14 x 7		4	5 "	54
15 x 7		5	5 1/2 "	58
16 x 7		5	6 "	62
18 x 7		6	7 "	66
20 x 7		6	9 "	70

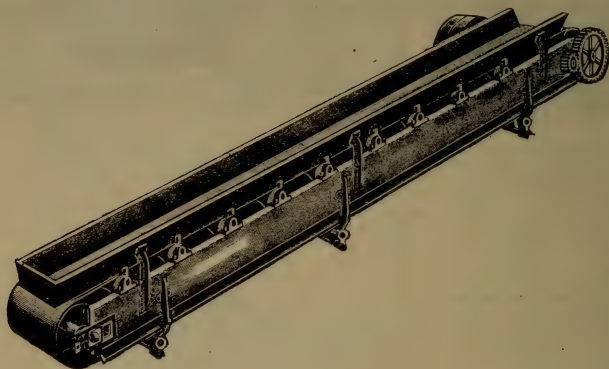
Galvanized Buckets.

Galvanized Buckets are made of steel and dipped in a galvanizing pot after being made. This makes a much stronger bucket than if made of galvanized sheet iron. They are in general use in Malt Houses, Breweries, Distilleries, etc.

Width on Belt	Projection	Price	Width on Belt	Projection	Price
6 x 4		\$0 25	10 x 5 1/2		\$0 45
7 x 4 1/2		30	11 x 6		48
8 x 5		35	12 x 6		52
9 x 5		40	14 x 6		56

**BELT CONVEYOR.**

FOR CLAY, SAND, STONE, ETC.



This machine will convey material on a level or to a moderate elevation. The belt is formed concave on the conveyor proper by the rollers. The sides of conveyor prevent material from working off. The bearings for the carrier rollers are provided with large oil and waste cups. The lower rollers support the belt and form separators for the sides of machine, as well as supporting the sideboards which prevent any material from getting on to the pulley side of the belt.

We also make these machines in sections so that they can be quickly shortened or extended. Adjustable ends or belt tighteners are furnished. The driving gearing can be either bevel or spur. Tight and loose driving pulley is furnished. Made in various widths and lengths to suit.

We can also furnish screw conveyors to drive in any direction. of any length and various diameters.

Prices on application.



MEDART PATENT

WROUGHT RIM PULLEYS.



# Whole, Split, or Tight-and-Loose.

WHOLE PULLEYS, SEE CUT No. 7. SPLIT PULLEYS, SEE CUT No. 9.

PLAIN TIGHT-AND-LOOSE PULLEYS, SEE CUT No. 10.

ADJUSTABLE SLEEVE TIGHT-AND-LOOSE PULLEYS, SEE CUT No. 10.

These pulleys range from forty to sixty per cent lighter than cast iron pulleys, for the same duty, whether for single, double, or triple-belt strains. The larger the pulley the greater the difference in weight.

We guarantee them as to strength, balance, trueness and durability, and agree that should they give out when used with belt for which they are designed we will furnish pulleys to replace them free of charge.

The faces of our pulleys are made of sufficient width to carry belts of the nominal width of faces given in our lists.

All pulleys used for tighteners should be ordered "Double Belt" pulleys.

Prices of pulleys of larger dimensions than listed will be furnished on application.

We are prepared to furnish pulleys covered with rubber belting or leather at lowest prices; also Wrought Rim Friction Pulleys.

## WHEN ORDERING

Give diameter, width of face, size of bore; state whether crowning or straight face, and whether for single, double or triple belt.

In the absence of instructions to the contrary, pulleys will be made wrought rim whole, and unless otherwise specified, single belt, and crowning face when not ordered straight face.

Each pulley is provided with two set screws without extra charge.

A moderate extra charge will be made for key-seats, extra set screws, babbiting and where bore is large in comparison with the size of pulley.

## TO FIND THE SIZE OF DRIVING PULLEY:

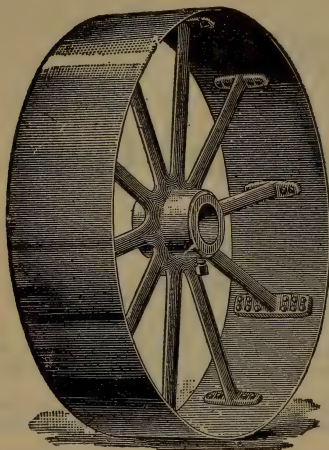
Multiply the diameter of the driven by the number of revolutions it shall make, and divide the product by the revolutions of the driver. The quotient will be the diameter of the driver. The diameter and revolutions of the driver being given, to find the diameter of the driven that shall make a given number of revolutions, multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven. The quotient will be the diameter of the driven.

## TO FIND NUMBER OF REVOLUTIONS OF THE DRIVEN PULLEY:

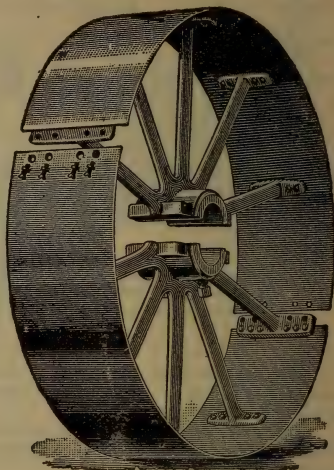
Multiply the diameter of the driver by its number of revolutions and divide by diameter of driven. The quotient will be the number of revolutions of the driven.

Liberal discount allowed from list prices.

Pulleys under 8 inches diameter will be furnished of cast iron.



CUT NO. 7.



CUT NO. 9.

## PULLEYS.

The objections to pulleys with cast iron rims are that they are badly balanced and unduly heavy and weak. It is a well-known fact that in casting such pulleys the rim chills in advance of the center, which causes the parts to be strained and weakened and the rim is liable to yield to a centrifugal strain. It is also very difficult to cast such pulleys with an even thickness of rim; and to secure a perfectly balanced cast iron rim pulley it is necessary to turn the rim both on the inside and the outside. By our improved construction and process of manufacturing we are enabled to offer pulleys entirely free from the defects characteristic of the cast iron pulleys. Our pulleys combine the minimum weight with the maximum strength, being 40 to 60 per cent lighter than cast iron pulleys for same duty. Our pulleys are absolutely without any shrinkage strain, the hubs and arms being cast without a rim. In making our pulleys the spiders (hubs and arms) are first centered and the hub bored. The spider is then ground concentrically with the axis of the pulley, after which the rim is attached and ground from the same center. The rim is of wrought metal of uniform thickness and width, and we make by this process a pulley as nearly perfect as can be made. These pulleys can be run at a high speed, which would be impracticable in a cast iron pulley, and the weight being much less admits of the use of much lighter shafting and hangers. We make Whole Pulleys, see cut No. 7; Split Pulleys, see cut No. 9; Tight and Loose Pulleys, see cut No. 10; Cone Pulleys, see cut No. 11; Clamp Hub Pulleys, see cut No. 47.



## PRICE LIST OF WROUGHT RIM WHOLE PULLEYS.

For additional prices of Split and Tight-and-Loose Pulleys see pages 33 &amp; 34.

## CIPHER CODE.

## MISCELLANEOUS.

Single Belt.....	Alabama.
Double Belt.....	Arizona.
Triple Belt.....	Arkansas.
Split Pulley.....	Colorado.
Tight-and-loose.....	Florida.
Crown Face.....	Georgia.
Straight Face.....	Idaho.
Tight-and-loose Pulley, with Sleeve.....	Indiana.
Four Set Screws.....	Iowa.
What is price of.....	Kansas.

## KEY-SEATS.

Key-seat, usual size.....	Tools.
" 1/2 in. wide.....	Calipers.
" 3/4 " ".....	Chucks.
" 1 " ".....	Drills.
" 1 1/2 " ".....	Files.
" 1 " ".....	Nippers.
" 1 1/2 " ".....	Pincers.
" 1 1/2 " ".....	Pliers.
" 1 1/2 " ".....	Shears.
" 1 1/2 " ".....	Sledges.

## SIZE OF BORE.

In.	Cipher.	In.	Cipher.
1	Africa	23/8	France
1 1/8	America	27/16	Germany
1 1/16	Asia	21/2	Greenland
1 1/4	Austria	25/8	Guinea
1 3/8	Belgium	21 1/16	Hayti
1 7/16	Bengal	23/4	Hungary
1 1/2	Bohemia	27/8	India
1 5/8	Borneo	21 5/16	Ireland
1 11/16	Canada	3	Italy
1 3/4	Ceylon	33/16	Jamaica
1 7/8	Chili	37/16	Japan
1 15/16	China	31 1/16	Monaco
2	Cuba	35/16	Norway
2 1/8	Denmark	43/16	Persia
2 1/16	Ecuador	47/16	Russia
2 1/4	England	41 5/16	Sweden

## SHIPPING DIRECTIONS.

Ship by Express.....	Express.
Ship by Rail.....	Freight.
Ship by River.....	River.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
8	3	Abner.....	\$2 95	\$3 30	11	8	Agency.....	\$4 90	\$5 80
	4	Abo.....	3 15	3 55		9	Agnew.....	5 25	6 20
	5	Abrams.....	3 40	3 80		10	Ajax.....	5 60	6 60
	6	Absecon.....	3 70	4 20		3	Akron.....	3 40	4 05
	7	Absher.....	4 00	4 60		4	Alamo.....	3 70	4 40
	8	Abydel.....	4 30	4 95		5	Alander.....	4 00	4 75
	9	Acasto.....	3 00	3 45		6	Alanthus.....	4 30	5 10
	4	Achilles.....	3 25	3 70		7	Albany.....	4 65	5 55
9	5	Acker.....	3 50	3 95	8	8	Albert.....	5 00	6 00
	6	Acme.....	3 80	4 35		9	Alburg.....	5 35	6 50
	7	Acworth.....	4 10	4 80		10	Alburtis.....	5 70	7 00
	8	Ada.....	4 40	5 10		11	Alcona.....	6 15	7 50
	10	Adair.....	3 10	3 55		12	Alexander.....	6 70	8 00
	4	Adams.....	3 35	3 85	13	3	Alford.....	3 55	4 30
	5	Adaville.....	3 60	4 15		4	Algiers.....	3 85	4 05
	6	Addie.....	3 90	4 50		5	Algoma.....	4 15	5 00
10	7	Addison.....	4 20	5 00		6	Alhambra.....	4 50	5 40
	8	Adell.....	4 50	5 30		7	Alleghany.....	4 85	5 80
	9	Adgers.....	4 80	5 65		8	Allendale.....	5 20	6 20
	10	Adobe.....	5 15	6 00		9	Alleyton.....	5 55	6 65
11	3	Adolphus.....	3 25	3 80	10	10	Alliance.....	6 00	7 15
	4	Adonis.....	3 55	4 15		11	Almaden.....	6 50	7 65
	5	Adrian.....	3 85	4 55		12	Almo.....	7 00	8 25
	6	Aetna.....	4 20	4 95	14	3	Almond.....	3 75	4 50
	7	Afton.....	4 55	5 35		4	Almora.....	4 10	4 85

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.				Single Belt.	Double Belt.	Triple Belt.
14	5	Alonzo.....	\$4 45	\$5 25	19	8	Ashford.....	\$6 95	\$8 30	
	6	Alpena.....	4 80	5 65		9	Ashland.....	7 45	9 00	
	7	Alpha.....	5 20	6 10		10	Ashport.....	8 00	9 75	
	8	Alps.....	5 60	6 55		11	Ashton.....	8 55	10 50	
	9	Alstead.....	6 10	7 05		12	Ashwood.....	9 10	11 30	
	10	Altamont.....	6 40	7 55		14	Askew.....	10 40	13 10	
	11	Althouse.....	6 80	8 05		16	Aspen.....	11 80	14 90	
	12	Alton.....	7 35	8 55		18	Atco.....	13 90	17 00	
	14	Alvada.....	8 35	9 85	20	3	Athel.....	4 95	5 95	
15	3	Alvord.....	3 95	4 75		4	Athens.....	5 35	6 40	
	4	Amascus.....	4 25	5 10		5	Atherton.....	5 80	7 15	
	5	Amador.....	4 60	5 50		6	Athlone.....	6 25	7 90	
	6	Amanda.....	4 95	5 90		7	Athol.....	6 70	8 65	
	7	Amargo.....	5 30	6 35		8	Atkins.....	7 15	9 40	\$12 20
	8	Amazon.....	5 70	6 85		9	Atlanta.....	7 65	10 15	12 29
	9	Amboy.....	6 10	7 35		10	Atoka.....	8 15	10 90	13 40
	10	Amedee.....	6 50	7 85		11	Attilla.....	8 70	11 65	14 60
	11	Amelia.....	7 00	8 35		12	Atwater.....	9 25	12 40	15 00
	12	Ames.....	7 50	8 85		14	Atwood.....	10 65	14 00	18 00
	13	Amherst.....	8 60	10 10		16	Aubrey.....	12 15	15 90	20 20
16	3	Ammon.....	4 15	5 05		18	Aucilla.....	14 35	17 80	22 50
	4	Amor.....	4 45	5 40		20	Audley.....	16 70	19 90	24 90
	5	Amos.....	4 80	5 75	21	3	Audubon.....	5 10	6 15	
	6	Amsden.....	5 15	6 20		4	Augusta.....	5 50	6 60	
	7	Anabel.....	5 50	6 65		5	Aurelia.....	5 95	7 40	
	8	Anacoco.....	5 90	7 15		6	Austin.....	6 40	8 20	
	9	Anderson.....	6 30	7 65		7	Autumn.....	6 85	9 00	
	10	Andes.....	6 70	8 15		8	Avalon.....	7 30	9 30	11 80
	11	Andover.....	7 20	8 65		9	Avenue.....	7 85	10 60	13 00
	12	Andrews.....	7 70	9 15		10	Avery.....	8 40	11 40	14 00
	13	Andy.....	8 95	10 45		11	Avilla.....	8 95	12 20	15 35
	14	Angola.....	10 25	11 90		12	Avondale.....	9 50	13 00	16 05
17	3	Angus.....	4 35	5 30		14	Axford.....	11 00	15 00	18 50
	4	Anhalt.....	4 65	5 65		16	Axtel.....	13 00	17 00	21 30
	5	Anita.....	5 00	6 00		18	Aycock.....	15 35	19 00	23 60
	6	Anna.....	5 35	6 35		20	Ayers.....	17 70	21 00	26 20
	7	Anness.....	5 75	6 80	22	3	Azalia.....	5 25	6 35	
	8	Annette.....	6 15	7 30		4	Azusa.....	5 65	6 80	
	9	Anoka.....	6 65	7 80		5	Babb.....	6 10	7 65	
	10	Ansel.....	7 00	8 30		6	Babcock.....	6 55	8 50	
	11	Anson.....	7 50	8 80		7	Baby.....	7 00	9 35	
	12	Antelope.....	8 00	9 30		8	Bacchus.....	7 45	10 20	12 40
	13	Anthony.....	9 25	10 80		9	Bachelor.....	8 00	11 05	13 55
	14	Ararat.....	10 60	12 30		10	Bacchone.....	8 55	11 90	14 70
18	3	Arbela.....	4 55	5 50		11	Bacon.....	9 10	12 75	16 00
	4	Arbroth.....	4 85	5 85		12	Baden.....	9 65	13 60	17 30
	5	Arbutus.....	5 25	6 25		14	Bagdada.....	11 75	15 80	20 80
	6	Arcata.....	5 65	6 65		16	Bagley.....	14 00	18 05	23 20
	7	Arcot.....	6 05	7 10		18	Bailey.....	16 35	20 30	24 80
	8	Ardmore.....	6 50	7 65		20	Baird.....	18 70	22 65	27 40
	9	Aredale.....	7 00	8 25	23	3	Baldwin.....	5 40	6 55	
	10	Argand.....	7 55	8 90		4	Balston.....	5 80	7 00	
	11	Argenta.....	8 10	9 60		5	Baltic.....	6 25	7 85	
	12	Arnold.....	8 65	10 30		6	Banana.....	6 70	8 70	
	13	Arnot.....	9 90	12 00		7	Rangor.....	7 15	9 55	
	14	Aroma.....	11 30	13 70		8	Banker.....	7 60	10 40	13 80
	16	Arthur.....	13 40	16 40		9	Baptist.....	8 15	11 25	14 00
19	3	Arvon.....	4 80	5 75		10	Baraboo.....	8 75	12 10	15 30
	4	Asbury.....	5 20	6 20		11	Barclay.....	9 35	12 95	16 70
	5	Ascalon.....	5 65	6 65		12	Bardwell.....	9 95	13 80	18 10
	6	Ashburn.....	6 05	7 10		14	Barley.....	12 25	16 15	20 70
	7	Ashcroft.....	6 45	7 55		16	Barlow.....	15 30	18 55	23 20

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
23	18	Barnard .....	\$17 50	\$20 95	\$26 00	27	14	Blount .....	\$16 90	\$19 00	\$24 10
	20	Barnes .....	20 00	23 35	29 00		16	Blythe .....	19 30	21 60	27 50
24	3	Barnett .....	5 60	6 80			18	Boaz .....	21 60	23 90	31 00
	4	Barnum .....	6 00	7 20			20	Bogard .....	24 50	26 80	35 10
	5	Barren .....	6 45	8 15			22	Boggs .....	28 00	30 30	39 30
	6	Barry .....	7 00	9 00			24	Bogue .....	31 50	33 80	43 50
	7	Barry .....	7 50	9 90			26	Boise .....		37 30	49 30
	8	Barlett .....	8 10	10 50	13 40	28	3	Boles .....	7 20	8 00	
	9	Barlow .....	8 75	11 70	14 05		4	Bollivar .....	7 60	8 50	
	10	Bartram .....	9 40	12 00	15 95		5	Bolton .....	8 35	9 35	
	11	Bascom .....	10 05	13 50	17 40		6	Bonzanza .....	9 30	10 35	
	12	Basic .....	10 70	14 40	18 90		7	Bonham .....	10 25	11 50	
	13	Bassett .....	11 10	16 50	21 00		8	Bonita .....	11 10	12 70	16 00
	14	Batavia .....	12 20	19 20	24 20		9	Bonus .....	12 05	13 85	17 35
	15	Batdorf .....	18 40	21 60	27 20		10	Boone .....	13 10	14 95	18 80
	16	Bates .....	20 90	24 00	30 40		11	Booth .....	14 15	16 00	20 30
	17	Battery .....	23 40	26 50	34 00		12	Bostic .....	15 15	17 15	21 90
25	24	Battle .....	26 00	29 00	38 40		13	Boston .....	17 40	19 75	25 00
	3	Bayou .....	6 30	7 30			14	Bourbon .....	19 75	22 00	28 60
	4	Bazaar .....	6 65	7 75			15	Bowen .....	22 00	25 50	32 50
	5	Beach .....	7 30	8 70			16	Bowman .....	25 50	28 40	36 90
	6	Beards .....	8 05	9 60			17	Boycott .....	28 40	31 50	41 50
	7	Beckers .....	9 00	10 65			18	Royd .....	32 20	35 30	46 20
	8	Bedford .....	9 80	11 75	14 35		19	Boynnton .....		39 10	52 00
	9	Beebe .....	10 35	12 45	15 45	29	3	Bozler .....	7 45	8 70	
	10	Belair .....	11 25	13 40	16 55		4	Bradley .....	7 85	9 00	
	11	Belfast .....	12 30	14 40	17 80		5	Brady .....	8 65	9 80	
	12	Belgrade .....	13 40	15 50	19 40		6	Brainard .....	9 55	10 55	
	13	Belmont .....	15 00	17 50	22 25		7	Brake .....	10 50	11 80	
	14	Beloit .....	17 90	19 80	25 30		8	Bramble .....	11 45	13 10	16 40
	15	Bemis .....	20 20	22 10	28 40		9	Branch .....	12 40	14 20	17 50
	16	Bender .....	22 60	24 50	31 60		10	Brandt .....	13 50	15 30	19 30
	17	Bennett .....	25 20	27 10	35 40		11	Brashear .....	14 55	16 50	20 90
	18	Benson .....	27 80	30 00	40 00		12	Bravo .....	15 60	17 85	22 65
26	25	Berea .....		33 25	45 00		13	Braxton .....	18 05	20 50	26 00
	3	Berlin .....	6 70	8 10			14	Brazos .....	20 65	23 45	29 90
	4	Bermuda .....	7 05	8 10			15	Breeze .....	23 20	26 30	33 00
	5	Bernard .....	7 60	8 95			16	Bremen .....	26 30	29 15	38 20
	6	Bertha .....	8 50	9 95			17	Bridgeton .....	30 00	33 90	42 90
	7	Bessemer .....	9 45	10 95			18	Brier .....	33 80	36 70	47 70
	8	Rethany .....	10 40	12 00	14 75		19	Briggs .....		40 60	53 60
	9	Rethel .....	11 30	12 95	15 95		20	Bristol .....		44 50	57 60
	10	Beulah .....	12 25	13 85	17 15	30	30	Broadland .....		48 45	61 50
	11	Beverly .....	13 20	14 90	18 60		3	Brigham .....	7 70	8 45	
	12	Bigelow .....	14 10	15 95	20 10		4	Broadway .....	8 10	8 95	
	13	Bigfoot .....	16 30	18 25	23 15		5	Brocton .....	8 95	9 85	
	14	Billings .....	18 70	20 65	26 40		6	Brodie .....	9 80	10 85	
	15	Bismarck .....	21 10	23 05	29 80		7	Brolaski .....	10 75	12 10	
	16	Bixby .....	23 60	25 60	33 30		8	Bromley .....	11 75	13 30	16 70
	17	Blackford .....	26 40	28 50	37 00		9	Broncho .....	12 85	14 65	18 25
	18	Blackman .....	29 60	31 70	41 70		10	Bronson .....	13 90	15 90	20 00
	19	Blackstone .....		34 90	46 50		11	Brooklyn .....	15 00	17 20	21 90
27	3	Blaine .....	6 90	7 75			12	Broome .....	16 10	18 55	23 90
	4	Blairs .....	7 30	8 25			13	Brown .....	18 75	21 20	26 60
	5	Blakely .....	7 90	9 10			14	Bruin .....	21 50	24 20	30 90
	6	Blalock .....	8 85	10 10			15	Brummel .....	24 30	27 10	35 10
	7	Blanco .....	9 80	11 30			16	Bruno .....	27 50	30 60	40 00
	8	Blandon .....	10 75	12 50	15 60		17	Brunswick .....	31 00	35 00	45 00
	9	Bliss .....	11 70	13 50	16 70		18	Brushy .....	34 50	38 50	50 00
	10	Block .....	12 70	14 50	17 90		19	Bryan .....	38 20	42 20	55 00
	11	Blood .....	13 70	15 50	19 40		20	Bryson .....	42 00	46 00	60 00
	12	Bloomer .....	14 60	16 50	21 00		21	Buchanan .....	46 00	50 00	66 00

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.



Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
31	3	Bucher.....	\$7 90	\$3 70		34	8	Carmel.....	\$13 35	\$15 05	\$19 10
	4	Buckeye.....	8 35	9 15			9	Carney.....	14 45	16 55	21 10
	5	Buckhorn.....	9 20	10 10			10	Carrier.....	15 50	18 00	23 20
	6	Buckners.....	10 10	11 15			11	Carroll.....	16 90	19 55	25 50
	7	Bucktown.....	11 10	12 50			12	Carter.....	18 30	21 00	27 90
	8	Budan.....	12 10	14 00	\$17 50		14	Carthage.....	22 10	24 80	32 20
	9	Budd.....	13 10	15 35	19 25		16	Cascade.....	25 90	28 60	36 70
	10	Budge.....	14 25	16 55	21 10		18	Caspar.....	29 70	32 40	41 30
	11	Buena.....	15 45	17 75	23 10		20	Catalpa.....	33 50	36 35	46 00
	12	Buffalo.....	16 65	19 10	25 10		22	Catlin.....	38 30	41 60	50 90
	14	Buford.....	19 70	22 15	28 20		24	Catoosa.....	42 10	45 45	56 00
	16	Bughall.....	22 75	25 30	31 50		26	Cecil.....	45 90	49 70	61 30
	18	Bulkley.....	26 00	28 60	35 80		28	Celina.....	49 70	53 35	66 80
	20	Bumpus.....	29 25	31 85	40 80		30	Chalk.....	52 60	58 00	73 00
	22	Buncombe.....	32 75	36 75	46 00	35	3	Chaley.....	8 80	9 65	
	24	Burbank.....	36 25	40 25	51 30		4	Chambers.....	9 25	10 10	
	26	Burden.....	39 75	43 75	56 80		5	Chandler.....	10 25	11 15	
	28	Burdick.....	43 35	47 35	62 40		6	Chapman.....	11 30	12 35	
	30	Burgess.....	47 00	51 50	68 10		7	Charity.....	12 50	14 05	
32	3	Burget.....	8 15	8 95			8	Charles.....	13 70	15 50	19 80
	4	Burke.....	8 60	9 40			9	Chase.....	14 90	17 35	21 95
	5	Burnett.....	9 50	10 40			10	Chatham.....	16 10	18 55	24 15
	6	Burnham.....	10 40	11 45			11	Cheek.....	17 50	20 15	26 55
	7	Burnside.....	11 40	12 90			12	Cheraw.....	18 95	21 75	29 00
	8	Busbee.....	12 50	14 25	17 90		14	Cherokee.....	22 95	25 75	33 30
	9	Bushnell.....	13 50	15 55	19 70		16	Cherry.....	26 95	29 75	37 90
	10	Buskirk.....	14 60	16 85	21 60		18	Chester.....	31 00	33 80	42 70
	11	Butcher.....	15 90	18 30	23 70		20	Chestnut.....	35 00	37 80	47 70
	12	Butler.....	17 25	19 70	26 00		22	Chicago.....	39 00	43 00	53 00
	14	Butte.....	20 60	23 05	29 60		24	Childs.....	43 00	47 00	58 50
	16	Buxton.....	24 00	26 50	33 30		26	Chilton.....	47 00	51 00	64 20
	18	Byron.....	27 40	29 90	38 00		28	Choctaw.....	51 00	55 00	70 10
	20	Cabin.....	30 80	33 30	42 80		30	Choteau.....	55 00	60 50	76 10
	22	Cabott.....	34 40	38 00	47 80	36	3	Churchey.....	9 05	9 90	
	24	Caddo.....	38 50	42 10	52 90		4	Cicero.....	9 50	10 35	
	26	Cadmus.....	41 60	45 20	58 10		5	Citrus.....	10 50	11 50	
	28	Cady.....	45 25	48 85	63 60		6	Clafin.....	11 60	12 70	
	30	Cahokia.....	49 00	53 75	69 20		7	Clancey.....	12 80	14 25	
33	3	Cain.....	8 35	9 15			8	Clara.....	14 00	16 05	20 65
	4	Cairo.....	8 80	9 65			9	Clarence.....	15 25	17 70	22 90
	5	Calcutta.....	9 70	10 65			10	Clarkson.....	16 45	19 25	25 20
	6	Calhoun.....	10 70	11 75			11	Claxton.....	18 00	21 00	27 70
	7	Calico.....	11 80	13 30			12	Claypool.....	19 60	22 50	30 30
	8	Calpella.....	12 90	14 60	18 40		14	Clear.....	23 60	26 45	34 80
	9	Calumet.....	14 00	16 00	20 30		16	Cleaver.....	27 60	30 45	39 50
	10	Calvary.....	15 10	17 40	22 30		18	Cleburne.....	31 60	34 50	44 40
	11	Calverj.....	16 40	18 85	24 50		20	Cleghorn.....	35 60	38 85	49 50
	12	Calvin.....	17 75	20 30	26 90		22	Clements.....	40 00	45 00	54 80
	14	Cambra.....	21 50	24 00	31 00		24	Cleveland.....	44 40	49 40	60 30
	16	Camden.....	24 35	27 00	35 20		26	Clifford.....	48 80	53 80	66 00
	18	Cameron.....	28 15	30 80	39 60		28	Clifton.....	53 20	58 30	71 90
	20	Campbell.....	32 00	34 70	44 10		30	Climax.....	57 60	63 70	78 00
	22	Canby.....	35 90	39 50	49 10	37	4	Clipper.....	9 75	10 60	
	24	Canfield.....	39 70	43 40	54 50		5	Clopton.....	10 75	11 75	
	26	Canoe.....	43 50	47 20	59 50		6	Cloud.....	11 90	13 05	
	28	Canton.....	47 30	51 10	65 00		7	Clover.....	13 15	15 05	
	30	Capon.....	51 10	56 00	70 60		8	Cluster.....	14 50	16 65	21 50
34	3	Cappard.....	8 55	9 35			9	Clyde.....	15 90	18 35	23 90
	4	Carbon.....	9 00	9 85			10	Coakley.....	17 35	20 00	26 30
	5	Carlisle.....	10 00	10 90			11	Coates.....	18 90	21 70	29 00
	6	Carlson.....	11 00	12 05			12	Cobalt.....	20 45	23 55	31 80
	7	Carlson.....	12 20	13 40			14	Cobden.....	24 45	27 35	36 50

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
37	16	Coburns.....	\$28 45	\$31 35	\$41 40	41	4	Creswell .....	\$10 00	\$12 20	
	18	Cochran.....	32 45	35 40	46 50		6	Crete.....	12 30	13 75	
	20	Coleman.....	36 45	39 65	51 80		8	Cripple.....	13 75	15 30	
	22	Coleridge.....	41 00	46 50	57 30		10	Crockett.....	15 60	17 85	
	24	Colfax.....	45 50	50 80	63 00		12	Cromwell.....	17 45	20 00	\$26 00
	26	Colgate.....	50 00	55 40	68 90		14	Crosley.....	19 40	22 00	28 90
	28	College.....	54 50	60 25	75 00		16	Cross.....	21 35	24 35	31 90
38	30	Collier.....	59 00	65 05	81 30		18	Crowell.....	23 30	26 40	35 30
	32	Collins.....	10 00	10 90			20	Crowleys.....	25 25	28 65	38 90
	34	Coloma.....	11 10	12 15			22	Crystal.....	29 25	34 60	44 40
	36	Colton.....	12 25	13 50			24	Culver.....	33 25	38 15	50 10
	38	Columbus.....	13 05	15 30			26	Cummings.....	37 25	43 15	56 00
	40	Colvin.....	15 10	17 20	22 50		28	Curtice.....	41 75	47 65	62 10
	42	Colyer.....	16 55	19 00	24 95		30	Custer.....	46 75	55 00	68 40
	44	Comfort.....	18 55	20 85	27 45		32	Cyclone.....	52 25	61 00	74 90
	46	Commerce.....	19 65	22 50	30 30		34	Cypress.....	57 75	66 50	81 60
	48	Company.....	21 30	24 50	33 30		36	Dabney.....	63 25	72 00	88 50
	50	Compton.....	25 30	28 50	38 10		38	Dallas.....	68 25	78 00	95 60
	52	Conant.....	29 30	32 55	43 10	42	4	Dalton.....	11 35	12 55	
	54	Concert.....	33 30	36 70	48 30		6	Damsel.....	12 80	14 10	
	56	Coney.....	38 30	41 50	53 70		8	Danbury.....	14 35	15 95	26 60
	58	Congo.....	42 70	48 00	59 30		10	Daniel.....	16 20	18 30	29 60
	60	Conkling.....	47 40	52 75	65 10		12	Danton.....	18 05	20 60	32 90
	62	Corner.....	52 10	57 45	71 10		14	Darnall.....	20 00	22 70	36 50
	64	Conrad.....	55 90	61 35	77 30		16	Darwin.....	22 00	25 20	40 30
	66	Conroy.....	60 70	67 55	83 70		18	David.....	24 00	27 40	46 00
39	68	Converse.....	10 25	11 15			20	Daves.....	26 00	29 50	49 30
	70	Cooke.....	11 50	12 50			22	Dawson.....	30 00	34 40	53 00
	72	Cooper.....	12 75	14 00			24	Dayton.....	34 50	39 10	59 00
	74	Coosa.....	14 30	16 30			26	Deane.....	39 00	44 60	64 20
	76	Cope.....	15 90	17 90	23 60		28	Defiance.....	43 50	49 10	70 40
	78	Copley.....	17 50	19 65	26 20		30	Delano.....	48 50	56 70	83 80
	80	Copper.....	19 10	21 70	28 80		32	Delano.....	54 00	62 75	90 20
	82	Cora.....	20 80	23 40	31 80		34	Delwood.....	59 50	68 25	98 00
	84	Corbett.....	22 70	25 45	35 00		36	Delmar.....	65 00	73 90	
	86	Corbin.....	26 70	30 40	40 00		38	Delton.....	70 50	79 75	
	88	Corдова.....	30 70	34 40	45 20	43	4	Dennis.....	11 70	12 80	
	90	Corey.....	34 70	38 45	50 40		6	Denver.....	13 25	14 45	
	92	Coriane.....	39 40	43 30	56 00		8	Deposit.....	14 80	16 20	
	94	Corn.....	44 10	49 90	61 80		10	Derby.....	16 75	18 85	
	96	Cornell.....	48 90	54 70	67 80		12	Detroit.....	18 70	21 35	27 40
	98	Cornish.....	53 70	59 50	74 00		14	Dexter.....	20 65	23 40	30 50
	100	Cornwall.....	58 50	64 35	80 40		16	Diamond.....	22 65	26 00	33 90
40	102	Cortland.....	63 30	69 65	87 00		18	Dickens.....	24 70	28 35	37 60
	104	Corydon.....	10 50	11 90			20	Dillard.....	26 75	30 65	41 50
	106	Cottage.....	11 85	13 40			22	Dillard.....	31 00	35 50	47 50
	108	Cotton.....	13 20	15 00			24	Dinsmore.....	35 25	41 15	53 60
	110	Council.....	15 00	17 35			26	Dixie.....	39 75	46 00	59 80
	112	Country.....	16 00	19 30	25 10		28	Dixon.....	44 50	50 85	66 20
	114	Covello.....	18 80	21 25	27 80		30	Dobbins.....	50 00	59 50	72 40
	116	Covert.....	20 70	23 50	30 70		32	Dockery.....	55 50	65 00	79 20
	118	Coward.....	22 60	25 50	33 90		34	Doctor.....	61 00	70 50	86 20
	120	Coyle.....	24 50	27 70	37 30		36	Dodson.....	66 50	76 25	93 40
	122	Coyote.....	28 50	32 00	42 50		38	Dolores.....	72 00	81 75	100 80
	124	Craig.....	32 50	36 90	47 90		40	Dora.....	12 10	13 25	
	126	Crampton.....	36 50	41 60	53 50	44	4	Dorsey.....	13 75	15 10	
	128	Crandall.....	40 50	46 00	59 30		6	Douglas.....	15 50	16 85	
	130	Craven.....	45 50	53 75	65 30		8	Downey.....	17 35	19 30	
	132	Crawford.....	50 50	59 10	71 50		10	Dozier.....	19 35	22 00	28 05
	134	Crawl.....	55 50	64 40	77 90		12	Drakes.....	21 35	24 30	31 45
	136	Cream.....	60 50	69 50	84 50		14	Dresden.....	23 40	26 80	35 00
	138	Crescent.....	65 50	75 20	91 30		16	Drexel.....	25 45	29 30	38 40

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
44	13	Driacoll.....	\$27 50	\$ 31 65	\$42 50	47	28	Embry.....	\$75 00	\$85 50	\$104 60
	14	Drury.....	31 90	36 70	48 10		30	Emery.....	81 00	91 50	112 00
	16	Dryden.....	36 50	42 50	54 50	48	4	Emmett.....	13 60	14 70	
	18	Dublia.....	41 25	47 60	60 90		5	Endicott.....	15 50	16 00	
	20	Dukes.....	46 25	52 60	67 40		6	Energy.....	17 50	19 00	
	22	Dumbar.....	51 75	61 25	74 00		7	Enoch.....	19 60	21 80	
	24	Duncan.....	57 25	66 85	80 80		8	Eolian.....	21 70	24 80	31 30
	26	Dundee.....	62 75	72 60	88 00		9	Epworth.....	24 00	27 70	35 70
	28	Dunlap.....	68 25	78 10	95 40		10	Erastus.....	26 40	30 55	39 50
	30	Duplex.....	73 75	83 90	103 20		11	Ericson.....	28 90	33 35	43 50
45	4	Dupont.....	12 45	13 55			12	Eric.....	31 50	36 25	48 50
	5	Durango.....	14 20	15 40			14	Essex.....	36 50	41 95	55 00
	6	Durham.....	16 05	17 40			16	Kstelle.....	41 50	48 05	62 00
	7	Dustin.....	17 90	20 00			18	Estes.....	47 00	54 15	69 00
	8	Dutton.....	19 90	22 80	28 90		20	Eubank.....	52 50	60 35	76 00
	9	Duvall.....	21 95	25 25	32 60		22	Euclid.....	58 50	68 90	83 50
	10	Dwight.....	24 15	27 70	36 30		24	Eugene.....	64 50	74 95	91 50
	11	Dykes.....	26 40	30 45	39 80		26	Eunice.....	70 50	81 10	99 70
	12	Eades.....	28 65	32 85	44 10		28	Eureka.....	76 50	87 10	108 10
	14	Eagle.....	33 05	38 10	49 80		30	Evans.....	82 50	93 35	117 00
	16	Earle.....	37 65	44 10	56 00	50	6	Evarts.....	19 00	22 20	
	18	Easton.....	42 65	49 30	62 50		7	Everett.....	20 70	25 30	
	20	Echo.....	48 15	54 90	69 20		8	Ewing.....	23 00	28 10	34 00
	22	Eckley.....	53 65	63 25	76 00		9	Excello.....	25 40	31 30	38 00
	24	Eclipse.....	59 15	68 80	83 00		10	Exeter.....	28 15	34 70	43 00
	26	Economy.....	64 65	74 50	90 40		11	Fagans.....	30 95	38 20	47 00
	28	Eddy.....	70 15	80 10	98 20		12	Fairfax.....	33 75	41 80	52 00
	30	Eden.....	75 65	86 00	106 20		14	Fairmont.....	39 40	48 50	60 00
46	4	Edgar.....	12 85	13 90			16	Falcon.....	45 00	55 30	68 00
	5	Edgwood.....	14 70	15 95			18	Farmers.....	50 65	62 20	76 00
	6	Edina.....	16 65	18 00			20	Fayette.....	56 25	69 20	84 00
	7	Edison.....	18 60	20 50			22	Fedora.....	62 90	76 40	92 00
	8	Edith.....	20 60	23 50	29 70		24	Felix.....	69 50	83 70	100 00
	9	Edmond.....	22 65	26 05	33 50		26	Fellows.....	76 10	91 10	109 00
	10	Edmore.....	24 90	28 60	37 40		28	Felton.....	82 75	98 60	118 00
	11	Edna.....	27 25	31 10	41 00		30	Fergus.....	89 35	106 20	127 00
	12	Edom.....	29 60	33 95	45 40		32	Ferrell.....	95 85	113 90	136 00
	14	Edwards.....	34 00	39 40	51 50		34	Ferriss.....	102 50	121 70	145 00
	16	Edwin.....	38 60	45 50	58 10		36	Ferry.....	110 00	129 60	155 00
	18	Efner.....	44 10	51 00	64 90	52	6	Festus.....	20 50	23 50	
	20	Egan.....	49 60	56 55	71 70		7	Fidelity.....	22 20	26 50	
	22	Eggs.....	55 60	65 25	78 70		8	Fields.....	24 60	29 50	36 00
	24	Eiler.....	61 60	71 30	86 00		9	Filley.....	27 10	32 60	40 00
	26	Eland.....	67 60	77 30	93 60		10	Fillmore.....	29 90	35 80	44 00
	28	Elba.....	73 60	83 30	101 60		11	Findlay.....	32 70	39 40	49 00
	30	Elder.....	79 60	90 10	109 80		12	Fingal.....	35 50	43 00	54 00
47	4	Eldorado.....	13 15	14 30			14	Fisher.....	41 50	50 00	62 00
	5	Eldred.....	15 00	16 40			16	Fleming.....	47 50	57 10	70 00
	6	Eleanora.....	17 00	18 50			18	Fletcher.....	53 50	64 30	78 00
	7	Elgin.....	19 00	21 10			20	Flint.....	59 50	72 00	87 00
	8	Elijah.....	21 10	24 10	30 50		22	Flora.....	65 75	79 60	95 00
	9	Eliza.....	23 40	26 85	34 50		24	Florence.....	72 00	87 10	104 00
	10	Elk.....	25 75	29 60	38 50		26	Florid.....	78 50	94 80	112 00
	11	Elkhart.....	28 10	32 40	42 30		28	Flowers.....	85 00	102 60	121 00
	12	Ellen.....	30 50	35 10	46 90		30	Floyd.....	91 50	110 50	130 00
	14	Elliott.....	35 30	40 70	53 20		32	Flynn.....	98 00	118 50	139 00
	16	Ellis.....	40 10	46 90	60 00		34	Foley.....	105 00	127 10	149 00
	18	Elmer.....	45 60	52 50	67 00		36	Folsom.....	113 00	135 30	159 00
	20	Elmira.....	51 60	58 60	74 00		6	Forbes.....	22 00	25 00	
	22	Elmo.....	57 00	66 50	81 30	54	7	Fordham.....	23 70	28 05	
	24	Elroy.....	63 00	72 85	88 80		8	Foreman.....	26 20	31 20	38 00
	26	Elyria.....	69 00	79 50	96 40		9	Forney.....	28 80	34 45	42 00

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.

and 34.



Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
54	10	Forsythe.....	\$31 60	\$37 70	\$46 00	60	18	Gratiot.....	\$55 70	\$76 50	\$93 00
	11	Forward.....	34 50	41 30	51 00		20	Gravel.....	73 40	85 20	103 00
	12	Foster.....	37 40	44 90	56 00		22	Greely.....	81 20	94 20	113 00
	14	Fowler.....	43 75	51 90	64 00		24	Gregory.....	89 00	103 50	123 00
	16	Foxboro.....	50 50	59 00	72 00		26	Grenada.....	97 00	113 90	134 00
	18	Francis.....	56 75	66 30	80 00		28	Grimes.....	105 00	122 40	145 00
	20	Fraser.....	63 00	73 80	89 00		30	Groton.....	113 00	132 00	156 00
	22	Frederick.....	70 00	81 40	98 00		32	Grover.....	122 00	143 00	167 00
	24	Fredonia.....	76 40	89 40	107 00		34	Gypsy.....	131 00	152 50	178 00
	26	Freeland.....	83 25	97 80	116 00		36	Hager.....	140 00	164 00	191 00
	28	Freeport.....	90 50	106 40	126 00	62	6	Haigh.....	28 40	31 90	
	30	Fremont.....	97 50	115 10	136 00		7	Hake.....	30 10	35 00	
	32	French.....	104 75	123 90	146 00		8	Halifax.....	32 60	38 40	48 00
	34	Friars.....	112 00	132 90	157 00		9	Hallcock.....	35 70	42 20	53 00
	36	Friends.....	120 00	142 00	167 00		10	Hamburg.....	39 10	46 10	58 00
56	6	Frozen.....	23 50	26 50			11	Hamlet.....	42 65	50 00	63 00
	7	Fuller.....	25 20	29 60			12	Hamlin.....	46 25	54 00	68 00
	8	Fulton.....	27 70	32 80	40 00		14	Hammond.....	53 50	63 00	78 00
	9	Furnace.....	30 50	36 25	45 00		16	Hancock.....	61 20	72 20	88 00
	10	Gaines.....	33 30	39 50	50 00		18	Hanover.....	69 35	81 60	98 00
	11	Galena.....	36 20	43 10	55 00		20	Hanson.....	77 50	91 10	109 00
	12	Galt.....	39 30	46 80	60 00		22	Harbine.....	85 60	100 70	120 00
	14	Ganges.....	46 00	54 20	68 00		24	Harbour.....	93 75	110 60	131 00
	16	Garfield.....	53 50	61 80	77 00		26	Hardin.....	102 00	120 30	142 00
	18	Garland.....	60 00	69 90	86 00		28	Hargan.....	110 50	129 90	153 00
	20	Garnet.....	66 50	78 10	95 00		30	Hargrove.....	119 25	140 10	164 00
	22	Garvey.....	74 20	86 40	104 00		32	Harlem.....	128 50	150 50	175 00
	24	Garwood.....	80 80	94 80	114 00		34	Harlow.....	137 75	161 00	187 00
	26	Gaston.....	88 35	103 30	124 00		36	Harman.....	147 00	172 00	200 00
	28	Gazette.....	96 00	112 00	134 00	64	6	Härner.....	30 30	34 05	
	30	Genesee.....	103 50	120 90	144 00		7	Harnett.....	32 00	37 05	
	32	Geneva.....	111 00	130 00	154 00		8	Harold.....	34 50	40 55	51 00
	34	Genoa.....	119 00	139 20	164 00		9	Harper.....	37 80	44 05	56 00
	36	Gentry.....	127 00	148 40	174 00		10	Harris.....	41 50	48 95	61 00
58	6	Georges.....	25 00	28 25			11	Harrod.....	45 10	53 95	67 00
	7	Gertie.....	26 70	31 25			12	Hartford.....	48 90	57 35	73 00
	8	Gibbs.....	29 20	34 50	43 00		14	Hartman.....	56 30	66 45	84 00
	9	Gibson.....	32 00	38 00	48 00		16	Harvey.....	64 30	76 00	95 00
	10	Giddings.....	35 00	41 60	53 00		18	Harwood.....	73 00	85 60	106 00
	11	Gifford.....	38 25	45 20	58 00		20	Hastings.....	81 50	95 40	117 00
	12	Gilbert.....	41 50	49 10	63 00		22	Hatfield.....	90 00	105 40	128 00
	14	Giles.....	48 30	56 60	71 00		24	Hatton.....	98 50	115 00	139 00
	16	Gillett.....	55 80	64 50	80 00		26	Hawthorne.....	107 00	126 00	151 00
	18	Gillmore.....	62 85	72 60	90 00		28	Heaton.....	116 00	136 60	163 00
	20	Girard.....	70 00	81 10	100 00		30	Hebron.....	125 50	147 40	175 00
	22	Glades.....	77 70	90 00	110 00		32	Hedrick.....	135 00	158 40	187 00
	24	Glasgow.....	85 00	99 10	120 00		34	Helena.....	144 50	169 60	200 00
	26	Glencoe.....	92 65	107 30	130 00		36	Hemlock.....	154 00	181 00	213 00
	28	Glendale.....	100 50	117 60	140 00	66	6	Henkel.....	32 20	36 30	
	30	Globe.....	108 25	127 90	151 00		7	Hensley.....	34 00	39 20	
	32	Glover.....	116 50	136 50	162 00		8	Herbert.....	36 50	42 80	55 00
	34	Godfrey.....	125 00	146 10	173 00		9	Hercules.....	39 85	47 00	60 00
	36	Goodell.....	133 50	155 80	184 00		10	Herrmand.....	43 30	51 30	66 00
60	6	Gordon.....	26 50	30 00			11	Herrndon.....	47 30	55 70	72 00
	7	Gorham.....	28 20	33 00			12	Hester.....	51 20	60 20	78 00
	8	Goshen.....	30 70	36 25	45 00		14	Hickman.....	59 15	69 60	88 00
	9	Goulds.....	33 60	39 85	50 00		16	Hickory.....	67 65	79 40	99 00
	10	Gowen.....	36 80	43 55	55 00		18	Hidalgo.....	76 50	89 40	110 00
	11	Grafton.....	40 20	47 35	60 00		20	Higdon.....	85 25	99 80	121 00
	12	Graham.....	43 60	52 25	65 00		22	Higgins.....	94 25	110 00	133 00
	14	Granger.....	50 60	60 10	74 00		24	Highland.....	103 25	120 40	145 00
62	6	Granite.....	58 10	68 10	83 00		26	Hilton.....	112 25	131 20	157 00

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bures, key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
66	23	Hobson.....	\$121 75	\$142 40	\$169 00	74	9	Knapp.....	\$48 75	\$56 80	\$75 00
	30	Hoffman.....	131 50	153 00	181 00		10	Knight.....	53 00	62 00	81 00
	32	Hogan.....	141 50	165 00	194 00		11	Knob.....	57 35	67 30	87 00
	34	Holbrook.....	151 75	177 50	207 00		12	Ladlin.....	62 10	72 70	94 00
	36	Holliday.....	162 00	190 30	221 00		14	Lambert.....	71 60	83 90	107 00
68	6	Hollins.....	34 15	38 35			16	Lamont.....	82 25	95 40	120 00
	7	Hollman.....	36 00	41 35			18	Larimer.....	93 00	107 00	133 00
	8	Hollow.....	38 50	44 95	59 00		20	Larue.....	103 75	118 80	146 00
	9	Holmes.....	41 90	49 25	64 00		22	Latham.....	114 50	131 00	159 00
	10	Holt.....	45 60	53 05	70 00		24	Lawson.....	125 75	143 40	172 00
	11	Homer.....	49 50	58 15	76 00		26	Lebanon.....	137 00	156 40	186 00
	12	Hooker.....	53 50	62 75	82 00		28	Leeds.....	148 25	170 00	201 00
	14	Hopkins.....	62 00	72 60	92 00		30	Leeman.....	159 50	184 00	216 00
	16	Horace.....	71 00	83 10	103 00		32	Leewood.....	171 00	198 50	231 00
	18	Horatio.....	80 00	93 70	114 00		34	Legion.....	182 75	213 25	247 00
	20	Hornet.....	89 00	104 50	126 00		36	Lehigh.....	195 00	227 75	263 00
	22	Horton.....	98 50	115 50	138 00	76	8	Leland.....	48 00	55 50	73 00
	24	Houston.....	108 00	126 60	150 00		9	Lemars.....	51 50	59 80	79 00
	26	Howard.....	117 50	138 00	163 00		10	Lennox.....	56 20	65 10	85 00
	28	Hubbard.....	127 50	149 60	176 00		11	Leonard.....	61 00	71 00	92 00
	30	Hudson.....	137 50	161 40	189 00		12	Leroy.....	66 00	76 50	99 00
	32	Hughes.....	148 00	173 40	202 00		14	Lester.....	76 00	88 00	112 00
	34	Humboldt.....	159 00	185 80	215 00		16	Lewis.....	87 00	100 00	125 00
	36	Hunters.....	170 00	198 80	229 00		18	Limerick.....	98 00	112 30	138 00
70	6	Huntsman.....	39 05	40 55			20	Lincoln.....	109 00	124 90	151 00
	7	Huppert.....	38 00	43 55			22	Lindsay.....	120 00	137 60	165 00
	8	Hurley.....	40 50	47 25	62 00		24	Lisbon.....	132 00	151 10	179 00
	9	Huron.....	44 00	51 55	67 00		26	Lobster.....	144 00	165 10	194 00
	10	Hurst.....	47 60	56 05	73 00		28	Lockport.....	156 00	179 60	209 00
	11	Huxley.....	51 60	60 55	79 00		30	Locust.....	168 00	194 60	225 00
	12	Imogene.....	55 85	65 20	85 00		32	Logan.....	180 00	209 10	241 00
	14	Ingalls.....	64 60	75 20	96 00		34	Lowell.....	192 00	223 70	257 00
	16	Inman.....	74 25	86 30	108 00		36	Loyal.....	204 00	238 70	273 00
	18	Ionia.....	84 00	97 60	120 00	78	8	Loyd.....	52 25	60 00	78 00
	20	Ipavia.....	93 75	109 00	133 00		9	Luber.....	56 35	64 75	84 00
	22	Irene.....	103 75	120 60	146 00		10	Lucas.....	61 10	70 10	90 00
	24	Ironton.....	113 75	132 40	159 00		11	Ludlow.....	65 90	75 55	97 00
	26	Isabel.....	123 75	144 40	172 00		12	Lumber.....	70 90	81 10	104 00
	28	Jackson.....	134 00	156 60	185 00		14	Lydia.....	80 50	92 80	117 00
	30	Jameson.....	144 25	169 00	199 00		16	Lyons.....	91 50	105 00	130 00
	32	Jarretts.....	155 00	181 60	213 00		18	Mable.....	103 00	118 00	144 00
	34	Java.....	166 00	194 40	227 00		20	Macomb.....	114 50	131 40	158 00
	36	Jerico.....	178 00	207 40	241 00		22	Maddox.....	126 25	144 70	172 00
72	6	Jerman.....	38 00	42 75			24	Madison.....	138 50	158 80	186 00
	7	Jerner.....	40 00	45 75			26	Madrid.....	150 50	173 30	202 00
	8	Jerome.....	42 50	49 55	65 00		28	Magnolia.....	163 00	188 00	218 00
	9	Jersey.....	46 00	53 85	70 00		30	Mahon.....	175 50	203 50	234 00
	10	Jewell.....	49 70	58 05	76 00		32	Malcolm.....	188 00	218 20	250 00
	11	Johnson.....	53 70	63 55	82 00		34	Malvern.....	200 00	234 00	267 00
	12	Joliet.....	58 20	68 55	83 00		36	Mango.....	213 00	250 00	284 00
	14	Jones.....	67 20	79 00	100 00	80	8	Mangold.....	56 50	64 50	83 00
	16	Jordan.....	77 50	90 30	112 00		9	Manhart.....	61 20	69 70	89 00
	18	Judson.....	88 00	102 30	125 00		10	Manilla.....	66 00	75 00	96 00
	20	Jumbo.....	98 50	114 70	138 00		11	Marble.....	70 80	80 40	103 00
	22	Jupiter.....	109 00	127 10	152 00		12	Marcus.....	75 50	85 90	110 00
	24	Karney.....	119 50	139 60	166 00		14	Mason.....	85 00	97 40	123 00
	26	Keene.....	130 00	151 10	190 00		16	Mattoon.....	96 00	110 00	137 00
	28	Keller.....	140 50	163 90	204 00		18	Maumee.....	108 00	124 00	152 00
	30	Kellogg.....	151 00	176 90	208 00		20	Maxwell.....	120 00	138 20	167 00
	32	Kendall.....	162 00	190 10	222 00		22	Mayfield.....	132 50	152 60	182 00
	34	Kenton.....	173 00	203 50	236 00		24	Meadow.....	145 00	167 20	198 00
	36	Keokuk.....	186 00	217 00	251 00		26	Medora.....	157 00	182 00	214 00
74	8	Ketchum.....	45 25	52 50	69 00		28	Memphis.....	170 00	197 00	230 00

Pulleys of intermediate sizes at proportionate prices.

For additional prices for split and tight-and-loose pulleys see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

Cipher for bores, key-seats, etc., on page 17.



Diameter.	Face.	CIPHER.	PRICE.			Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.	Triple Belt.				Single Belt.	Double Belt.	Triple Belt.
80	30	Nancy.....	\$183 00	\$212 20	\$246 00	88	30	Peanut.....	\$220 00	\$253 00	\$292 00
	32	Nanson.....	196 00	227 60	262 00		32	Pedro.....	235 00	270 00	310 00
	34	Naomi.....	209 00	242 20	278 00		34	Pekin.....	250 00	287 00	338 00
	36	Naples.....	222 00	258 00	295 00		36	Penelope.....	265 00	304 00	346 00
82	8	Napton.....	60 50	69 00	91 00	90	10	Peoria.....	86 00	96 30	123 00
	9	Napper.....	65 20	74 00	97 00		11	Perkins.....	91 00	102 00	130 00
	10	Narcott.....	70 00	79 10	103 00		12	Peru.....	96 00	108 50	137 00
	11	Narrows.....	74 80	84 30	109 00		14	Peters.....	107 50	122 50	152 00
	12	Nasby.....	79 50	89 80	115 00		16	Phelps.....	121 50	139 00	170 00
	14	Nashua.....	89 25	101 50	128 00		18	Phoenix.....	136 00	157 00	189 00
	16	Nebo.....	100 50	116 00	144 00		20	Pierce.....	151 00	174 50	208 00
	18	Needmore.....	113 00	130 60	160 00		22	Plover.....	166 00	192 50	227 00
	20	Nekoma.....	125 50	145 30	176 00		24	Polands.....	182 00	211 00	247 00
	22	Nelson.....	138 00	160 10	192 00		26	Pomona.....	198 00	229 00	267 00
	24	Ncosho.....	151 00	175 00	208 00		28	Poncho.....	214 00	247 00	287 00
	26	Neptune.....	164 00	191 00	224 00		30	Popes.....	230 00	265 00	307 00
	28	Nestor.....	177 00	205 20	240 00		32	Postage.....	246 00	283 00	327 00
	30	Newark.....	190 00	220 60	256 00		34	Potomac.....	262 00	301 00	347 00
	32	Newcomb.....	204 00	236 10	273 00		36	Powell.....	278 00	319 00	367 00
	34	Newport.....	217 00	251 70	290 00	92	10	Pratt.....	90 00	100 40	128 00
	36	Newton.....	231 00	267 40	307 00		11	Preston.....	95 00	106 00	135 00
84	8	Nextdoor.....	64 50	73 30	95 00		12	Prince.....	100 00	112 00	142 00
	9	Nezton.....	69 20	78 10	101 00		14	Prospect.....	112 00	128 00	159 00
	10	Niagara.....	74 00	83 60	107 00		16	Pulaski.....	126 00	145 00	177 00
	11	Nicholls.....	78 80	88 40	113 00		18	Purcell.....	141 00	163 00	196 00
	12	Nickell.....	83 50	93 90	120 00		20	Putnam.....	157 00	181 00	215 00
	14	Noland.....	93 50	105 00	133 00		22	Quebec.....	173 00	200 00	235 00
	16	Norfolk.....	105 00	121 00	149 00		24	Quimby.....	189 00	219 00	255 00
	18	Norris.....	118 00	136 20	165 00		26	Racine.....	205 00	237 00	275 00
	20	Northern.....	131 00	151 50	181 00		28	Raleigh.....	222 00	257 00	296 00
	22	Norwich.....	144 00	167 00	198 00		30	Ralston.....	239 00	276 00	317 00
	24	Nutwood.....	157 00	182 70	215 00		32	Randall.....	256 00	295 00	338 00
	26	Oakes.....	170 00	198 60	232 00		34	Rathburn.....	273 00	314 00	359 00
	28	Obear.....	183 00	214 70	249 00		36	Rawlins.....	290 00	333 00	380 00
	30	Ocean.....	197 00	230 00	266 00	94	10	Raymond.....	94 00	104 50	133 00
	32	Odell.....	211 00	246 50	283 00		11	Redfield.....	99 00	110 00	140 00
	34	Odessa.....	225 00	263 20	301 00		12	Rembert.....	105 00	116 50	147 00
	36	Ogden.....	239 00	280 00	319 00		14	Renfro.....	118 00	134 00	166 00
86	10	Olmsted.....	78 00	88 10	113 00		16	Renow.....	132 00	151 00	184 00
	11	Olney.....	82 50	92 90	119 00		18	Reuben.....	148 00	170 00	204 00
	12	Oneida.....	87 65	99 40	126 00		20	Rhodes.....	164 00	189 00	224 00
	14	Ophir.....	98 25	112 00	140 00		22	Rialto.....	181 00	209 00	245 00
	16	Oregon.....	111 00	128 00	157 00		24	Richards.....	198 00	228 00	266 00
	18	Orlando.....	124 50	144 00	174 00		26	Richmond.....	215 00	247 00	287 00
	20	Osage.....	138 00	160 00	191 00		28	Riley.....	232 00	267 00	308 00
	22	Osborne.....	152 00	176 00	208 00		30	Rippon.....	250 00	287 00	329 00
	24	Osgood.....	166 00	192 00	225 00		32	Roanoke.....	268 00	307 00	350 00
	26	Oswego.....	180 00	208 50	242 00		34	Robbins.....	286 00	327 00	371 00
	28	Ottawa.....	194 00	225 00	260 00		36	Roberts.....	304 00	347 00	392 00
	30	Otten.....	208 00	241 50	278 00	96	10	Rockford.....	98 00	108 60	139 00
	32	Oxford.....	223 00	258 00	296 00		11	Rodman.....	103 00	114 50	146 00
	34	Ozone.....	238 00	275 00	314 00		12	Rodney.....	109 00	122 00	155 00
	36	Racific.....	253 00	292 00	332 00		14	Rogers.....	123 00	140 50	174 00
88	10	Paducah.....	82 00	92 20	118 00		16	Roland.....	138 00	157 00	193 00
	11	Palatka.....	86 80	97 70	125 00		18	Rollins.....	154 00	176 00	213 00
	12	Palmers.....	91 80	104 00	133 00		20	Rome.....	171 00	196 00	234 00
	14	Pampa.....	103 00	118 00	148 00		22	Roscoe.....	188 00	217 00	256 00
	16	Pandora.....	117 00	135 00	166 00		24	Roswell.....	206 00	237 00	278 00
	18	Panther.....	131 00	152 00	184 00		26	Rowen.....	224 00	257 00	300 00
	20	Paragon.....	145 00	169 00	202 00		28	Roxbury.....	242 00	277 00	322 00
	22	Parnell.....	160 00	186 00	220 00		30	Rumsey.....	260 00	297 00	344 00
	24	Pauline.....	175 00	203 00	238 00		32	Russell.....	278 00	317 00	366 00
	26	Pawnee.....	190 00	220 00	256 00		34	Sabula.....	296 00	337 00	388 00
	28	Paxton.....	205 00	236 50	274 00		36	Salem.....	315 00	358 00	410 00

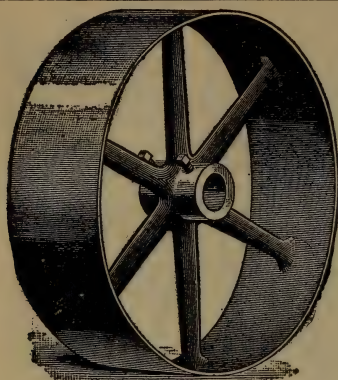
Prices of pulleys of larger dimensions than listed furnished on application.

Pulleys of intermediate sizes at proportionate prices.

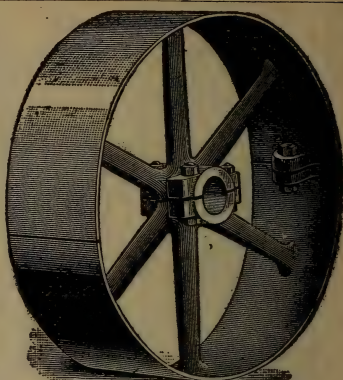
For additional prices for split and tight-and-loose pulleys, see pages 33 and 34.

For prices of cast-iron pulleys see page 26.

For cipher-for bores, key-seats, etc., see page 17.



WHOLE PULLEY.



SPLIT PULLEY.

# CAST IRON WHOLE PULLEYS.

MACHINE MOULDED-BORED, TURNED AND BALANCED.

For Additional Prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.

## PRICE LIST OF CAST IRON WHOLE PULLEYS.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
3	3	Abacat.....	\$1 35	\$1 45	7	7	Abeavance.....	\$3 20	\$3 50
	4	Abactor.....	1 50	1 60		8	Abhor.....	3 55	3 90
	5	Abades.....	1 70	1 80		8	Abhorrent.....	1 85	2 00
	6	Abapo.....	1 95	2 05		3	Abidance.....	2 25	2 40
4	3	Abatable.....	1 45	1 55		4	Abider.....	2 65	2 80
	4	Abatage.....	1 65	1 75		5	Abiding.....	3 00	3 20
	5	Abatude.....	1 85	2 00		6	Ability.....	3 35	3 60
	6	Abattship.....	2 10	2 25		7	Abjection.....	3 70	4 00
5	3	Abceder.....	1 55	1 65	9	3	Abjectness.....	2 00	2 20
	4	Abdals.....	1 80	1 95		4	Abjugate.....	2 40	2 60
	5	Abderite.....	2 15	2 30		5	Abjunctive.....	2 80	3 00
	6	Abdominal.....	2 50	2 65		6	Abjure.....	3 15	3 40
6	3	Abduce.....	1 65	1 75		7	Abjuring.....	3 50	3 80
	4	Abducent.....	1 85	2 10		8	Ablander.....	3 85	4 20
	5	Abed.....	2 30	2 45	10	3	Ablation.....	2 15	2 30
	6	Abensur.....	2 65	2 80		4	Ablative.....	2 55	2 75
	7	Aberrance.....	3 00	3 15		5	Ablaze.....	2 95	3 15
	8	Aberrant.....	3 35	3 55		6	Abligate.....	3 30	3 60
7	3	Aberring.....	1 75	1 90		7	Ablemar.....	3 65	4 00
	4	Abetted.....	2 15	2 30		8	Ableness.....	4 00	4 40
	5	Abetting.....	2 50	2 70		9	Ablenase.....	4 45	4 85
	6	Abetment.....	2 85	3 10		10	Ableplay.....	4 90	5 30

For additional prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.  
Cipher for Bore, Key-seals, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
11	3	Ablepsy.....	\$2 25	\$2 40	16	14	Complexion.....	\$9 80	\$10 90
	4	Ablette.....	2 65	2 80		16	Compliant.....	11 40	12 50
	5	Ablude.....	3 05	3 25					
	6	Abluent.....	3 45	3 75	17	3	Complot.....	3 25	3 55
	7	Ablution.....	3 85	4 25		4	Complotter.....	3 75	4 05
	8	Abluvion.....	4 30	4 80		5	Comport.....	4 25	4 75
	9	Abmentive.....	4 75	5 30		6	Compose.....	4 85	5 45
	10	Abmorse.....	5 25	5 80		7	Composit.....	5 50	6 15
						8	Composure.....	6 15	6 75
12	3	Abnegate.....	2 40	2 55		9	Compotier.....	6 80	7 45
	4	Abnormal.....	2 80	2 95		10	Comprise.....	7 45	8 15
	5	Abodance.....	3 20	3 35		11	Compter.....	8 10	8 90
	6	Aboding.....	3 60	3 85		12	Comptness.....	8 80	9 65
	7	Abolir.....	4 00	4 35		14	Compulsive.....	10 50	11 50
	8	Abolition.....	4 45	4 90		16	Computable.....	12 10	13 40
	9	Abolument.....	4 90	5 40					
	10	Abolopist.....	5 40	5 90	18	3	Compute.....	3 45	3 80
	11	Abolosent.....	5 90	6 40		4	Computing.....	4 00	4 35
	12	Abolquent.....	6 40	6 90		5	Comrade.....	4 55	5 00
13	3	Abolsado.....	2 55	2 70		6	Conamore.....	5 15	5 70
	4	Abonder.....	2 95	3 10		7	Concasser.....	5 85	6 45
	5	Abordage.....	3 35	3 50		8	Concavate.....	6 55	7 20
	6	Abortion.....	3 75	4 00		9	Concave.....	7 20	7 95
	7	Abortive.....	4 15	4 50		10	Concavity.....	7 85	8 70
	8	Aboutir.....	4 60	5 00		11	Concealer.....	8 50	9 45
	9	Abortment.....	5 05	5 50		12	Concede.....	9 30	10 25
	10	Aboundeth.....	5 50	6 15		14	Conceited.....	11 15	12 25
	11	Aboundedly.....	6 15	6 70		16	Conceiver.....	12 85	14 30
	12	Abraças.....	6 70	7 30					
14	3	Abovedar.....	2 70	2 90	19	3	Concentric.....	3 65	4 05
	4	Abrade.....	3 10	3 30		4	Concentual.....	4 20	4 60
	5	Abrading.....	3 50	3 75		5	Conception.....	4 80	5 30
	6	Abrasion.....	4 00	4 25		6	Concerned.....	5 50	6 00
	7	Abrazar.....	4 50	4 85		7	Concerning.....	6 20	6 75
	8	Abrensin.....	5 05	5 50		8	Concessive.....	6 90	7 50
	9	Abbranchia.....	5 60	6 10		9	Conciliate.....	7 55	8 25
	10	Abrenver.....	6 15	6 70		10	Concisely.....	8 25	9 00
	11	Abridgment.....	6 70	7 35		11	Concision.....	9 00	9 90
	12	Abrochar.....	7 25	7 90		12	Concitate.....	9 80	10 80
	14	Abrogation.....	8 35	9 00		14	Concluding.....	11 80	12 95
15	3	Abreption.....	2 90	3 10		16	Conclusion.....	13 80	15 10
	4	Abreyer.....	3 30	3 55		18	Concocter.....	15 80	17 25
	5	Abridge.....	3 75	4 05	20	3	Concoctive.....	3 85	4 25
	6	Abriter.....	4 25	4 65		4	Concourse.....	4 40	4 80
	7	Abroach.....	4 80	5 25		5	Concur.....	5 00	5 50
	8	Abrogate.....	5 35	5 85		6	Concurrent.....	5 70	6 20
	9	Abromado.....	5 90	6 45		7	Concussion.....	6 40	6 95
	10	Abruption.....	6 45	7 10		8	Condign.....	7 10	7 70
	11	Abruptness.....	7 05	7 75		9	Condiment.....	7 80	8 55
	12	Abcission.....	7 65	8 40		10	Condole.....	8 65	9 50
	14	Absinthian.....	9 10	10 00		11	Condolence.....	9 50	10 45
16	3	Abruptly.....	3 05	3 35		12	Conducent.....	10 35	11 50
	4	Abscess.....	3 55	3 85		14	Conducive.....	12 35	13 65
	5	Abscind.....	4 05	4 40		16	Conducting.....	14 40	15 85
	6	Absenter.....	4 60	5 00		18	Conductor.....	16 50	18 15
	7	Absenting.....	5 15	5 70					
	8	Absist.....	5 80	6 40		3	Confab.....	4 05	4 45
	9	Con piling.....	6 40	7 10		4	Confated.....	4 60	5 00
	10	Complacent.....	7 00	7 80		5	Confection.....	5 30	5 75
	11	Completive.....	7 60	8 50		6	Conference.....	6 00	6 55
	12	Complex.....	8 20	9 20		7	Confessory.....	6 75	7 35
						8	Confession.....	7 55	8 30
						9	Confidant.....	8 35	9 20
						10	Confinity.....	9 20	10 15

For additional prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.  
 Cipher for Bofes, Key-seats, etc., on page 17.



Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
21	11	Conflation.....	\$10 05	\$11 15	26	5	Contemn.....	\$6 85	\$7 60
	12	Conflict.....	10 90	12 15		6	Contempt.....	7 70	8 55
	14	Confluence.....	13 10	14 55		7	Contended.....	8 60	9 60
	16	Conformer.....	15 20	16 95		8	Contestor.....	9 60	10 70
	18	Confound.....	17 30	19 35		9	Context.....	10 80	11 95
22	3	Confrere.....	4 25	4 70	27	10	Continent.....	12 00	13 25
	4	Confront.....	4 80	5 25		11	Continual.....	13 20	14 55
	5	Confuse.....	5 55	6 10		12	Contorted.....	14 40	15 85
	6	Confusion.....	6 30	7 00		14	Contour.....	17 00	18 80
	7	Congea.....	7 15	7 95		16	Contralto.....	19 70	21 90
	8	Congeaing.....	8 10	8 95		18	Contrary.....	22 40	25 10
	9	Congenial.....	9 00	9 90		20	Contrast.....	25 40	28 40
	10	Congest.....	9 90	10 90		3	Cadetship.....	5 45	6 00
	11	Congestion.....	10 75	11 90		4	Cadger.....	6 25	6 90
	12	Congruity.....	11 65	12 90		5	Cadillac.....	7 45	7 90
23	14	Conject.....	13 90	15 35	28	6	Cadmean.....	8 05	8 95
	16	Conjecture.....	16 00	17 80		7	Caducous.....	9 00	10 05
	18	Conjoin.....	18 20	20 30		8	Cafardice.....	10 05	11 25
	3	Conjugal.....	4 45	4 95		9	Caffre.....	11 25	12 50
	4	Conjugate.....	5 05	5 60		10	Caillette.....	12 45	13 85
	5	Conjure.....	5 85	6 45		11	Caissons.....	13 70	15 15
	6	Connective.....	6 70	7 35		12	Cajolement.....	15 00	16 55
	7	Connection.....	7 55	8 40		14	Cajolery.....	17 80	19 75
	8	Connive.....	8 50	9 45		16	Calafetin.....	20 65	23 00
	9	Conquer.....	9 40	10 50		18	Calagozo.....	23 50	26 35
24	10	Conquest.....	10 35	11 55		20	Calabrain.....	26 50	29 75
	11	Conscience.....	11 30	12 60	29	3	Contrasted.....	5 70	6 25
	12	Conscious.....	12 30	13 65		4	Contribute.....	6 55	7 15
	14	Conscript.....	14 60	16 25		5	Contrite.....	7 50	8 25
	16	Consenter.....	17 00	18 90		6	Contriver.....	8 45	9 35
	18	Consequent.....	19 40	21 55		7	Control.....	9 45	10 50
	3	Conserve.....	4 80	5 30		8	Controller.....	10 55	11 80
	4	Consessor.....	5 45	6 05		9	Contusion.....	11 75	13 10
	5	Consistent.....	6 30	6 90		10	Convalesce.....	12 95	14 45
	6	Console.....	7 05	7 75		11	Convening.....	14 20	15 80
	7	Consoling.....	7 90	8 65		12	Convent.....	15 60	17 25
25	8	Consort.....	8 85	9 75	30	14	Conventual.....	18 60	20 70
	9	Consortion.....	9 80	10 85		16	Converge.....	21 60	24 15
	10	Constable.....	10 80	11 95		18	Conversant.....	24 60	27 60
	11	Constancy.....	11 80	13 05		20	Convoy.....	27 60	31 10
	12	Constate.....	12 90	14 30		3	Calahorra.....	5 95	6 45
	14	Constitute.....	15 40	17 10		4	Calamary.....	6 80	7 45
	16	Constitute.....	17 90	19 90		5	Calambour.....	7 80	8 60
	18	Constrain.....	20 40	22 75		6	Calamine.....	8 80	9 65
	20	Constrict.....	23 20	25 90		7	Calcareous.....	9 85	10 90
	3	Caballine.....	5 00	5 55		8	Calci form.....	11 00	12 30
26	4	Cabalmente.....	5 70	6 35	31	9	Calcining.....	12 25	13 65
	5	Cabaluste.....	6 55	7 25		10	Calcitrate.....	13 50	15 05
	6	Cabaretier.....	7 35	8 15		11	Calculable.....	14 75	16 45
	7	Cabecera.....	8 25	9 05		12	Caldaria.....	16 15	18 05
	8	Cabecilla.....	9 20	10 15		14	Calderada.....	19 30	21 60
	9	Cabestrar.....	10 30	11 40		16	Caldosito.....	22 45	25 20
	10	Cachalor.....	11 40	12 45		18	Calducho.....	25 60	28 70
	11	Cacharro.....	12 50	13 80		20	Calendular.....	28 75	32 25
	12	Cacholong.....	13 65	15 05	32	3	Cookery.....	6 20	6 70
	14	Cacklings.....	16 20	17 95		4	Cooler.....	7 10	7 80
	16	Cadastral.....	18 80	20 90		5	Coolness.....	8 10	8 95
	18	Cadeneta.....	21 40	23 90		6	Cooptate.....	9 15	10 10
	20	Cadenetto.....	24 30	27 15		7	Copiously.....	10 25	11 45
27	3	Construed.....	5 25	5 80		8	Copiant.....	11 45	12 85
	4	Consular.....	5 95	6 65		9	Coppice.....	12 75	14 25
28	5					10	Coptic.....	14 05	15 70
	6								

For additional prices for Split and Tight and Loose Pulleys, see pages 33 and 34.  
 Cipher for Bore, Key-seats, etc., on page 17.



Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
30	11	Copybook.....	\$15 35	\$17 15	35	3	Cancerated.....	\$7 15	\$7 70
	12	Copyright.....	16 75	18 90		4	Cancroma.....	8 05	8 85
	14	Coquette.....	20 00	22 50		5	Cancrine.....	9 10	10 05
	16	Coracle.....	23 30	26 20		6	Candela.....	10 30	11 45
	18	Coranto.....	26 60	29 80		7	Candonga.....	11 65	12 95
	20	Corbeau.....	29 90	33 40		8	Candytuft.....	13 00	14 50
31	3	Calenture.....	6 40	6 90		9	Canephore.....	14 35	16 05
	4	Calescence.....	7 30	8 00		10	Canescent.....	15 80	17 65
	5	Calfatage.....	8 30	9 15		11	Cangilon.....	17 30	19 30
	6	Calibita.....	9 35	10 30		12	Canicular.....	18 05	21 15
	7	Calipedes.....	10 45	11 65		14	Canivean.....	22 65	25 15
	8	Callosity.....	11 65	13 05		16	Cankerbit.....	26 20	29 15
	9	Calocha.....	12 95	14 45		18	Cannelure.....	20 80	33 20
	10	Calotype.....	14 25	15 90		20	Cansado.....	33 45	37 25
	11	Calquer.....	15 55	17 35	36	3	Costliness.....	7 35	7 90
	12	Calvinism.....	16 95	19 10		4	Cotangent.....	8 30	9 10
	14	Calvinize.....	20 20	22 70		5	Coterie.....	9 40	10 40
	16	Calvario.....	23 55	26 45		6	Cotillion.....	10 70	11 90
	18	Calycine.....	26 95	30 05		7	Cottrell.....	12 10	13 55
	20	Camarade.....	30 35	33 70		8	Couch.....	13 50	15 10
32	3	Corbeil.....	6 55	7 10		9	Couchant.....	14 90	16 70
	4	Cordial.....	7 45	8 20		10	Coughing.....	18 10	18 30
	5	Cordon.....	8 45	9 35		11	Couler.....	18 10	20 00
	6	Cormorant.....	9 55	10 50		12	Coulisse.....	20 10	22 05
	7	Cornamate.....	10 65	11 85		14	Counteract.....	23 60	26 10
	8	Cornbloom.....	11 85	13 25		16	Counteract.....	30 90	34 30
	9	Cornetcy.....	13 15	14 65		18	Countess.....	30 90	34 30
	10	Cornfield.....	14 45	16 10		20	Coupe.....	34 60	38 40
	11	Cornicle.....	15 75	17 55	38	3	Couplet.....	7 75	8 30
	12	Cornuted.....	17 15	19 30		4	Courage.....	8 80	9 05
	14	Coronet.....	20 40	22 90		5	Courier.....	10 10	11 15
	16	Corporal.....	23 80	26 70		6	Course.....	11 50	12 70
	18	Corpulence.....	27 30	30 30		7	Courteous.....	13 00	14 30
	20	Corpuscle.....	30 80	34 00		8	Courteous.....	14 50	15 95
33	3	Cambrure.....	6 75	7 30		9	Courtesy.....	16 00	17 00
	4	Cambusier.....	7 05	8 40		10	Courtezan.....	17 50	19 30
	5	Camellia.....	8 65	9 55		11	Courting.....	19 20	21 10
	6	Camisado.....	9 75	10 75		12	Courtlike.....	21 20	23 20
	7	Camouflet.....	10 90	12 10		14	Courtship.....	24 80	27 60
	8	Camously.....	12 15	13 55		16	Cousin.....	28 70	32 30
	9	Campechy.....	13 50	15 05		18	Covering.....	32 80	37 00
	10	Campement.....	14 80	16 55		20	Coverlet.....	32 80	37 00
	11	Campesino.....	16 10	18 10			Covetable.....	37 00	41 50
	12	Campestral.....	17 65	19 80	40	3	Cowherd.....	8 15	8 80
	14	Canaille.....	21 05	23 55		4	Cowhouse.....	9 25	10 20
	16	Canalita.....	24 50	27 40		5	Cowslip.....	10 75	11 85
	18	Canardeau.....	28 00	31 20		6	Coxcomb.....	12 25	13 50
	20	Cancellate.....	31 55	35 05		7	Coyness.....	13 75	15 20
34	3	Correcting.....	6 95	7 50		8	Crabbed.....	15 25	16 90
	4	Correspond.....	7 85	8 60		9	Crabtree.....	16 75	18 60
	5	Corridor.....	8 85	9 75		10	Crabstick.....	18 60	20 50
	6	Corrigible.....	9 95	11 00		11	Crack.....	20 30	22 40
	7	Corrivate.....	11 20	12 40		12	Cracknel.....	22 40	24 60
	8	Corrodent.....	12 50	13 90		14	Craggy.....	26 40	29 20
	9	Corrosive.....	13 85	15 45		16	Cramp.....	30 90	34 30
	10	Corsage.....	15 20	17 00		18	Cranesbill.....	35 40	39 30
	11	Corsair.....	16 50	18 60		20	Cranium.....	40 00	44 50
	12	Corselet.....	18 20	20 30	42	3	Cranky.....	8 55	9 30
	14	Cortesano.....	21 70	24 20		4	Crashing.....	9 80	10 80
	16	Cortical.....	25 20	28 10		5	Crater.....	11 30	12 45
	18	Cosecant.....	28 70	32 10		6	Cravache.....	12 85	14 20
	20	Cosey.....	32 30	36 10		7	Crazy.....	14 40	16 00
						8	Creak.....	16 05	17 90

For additional prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.

Cipher for Bores, Key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.		
			Single Belt.	Double Belt.				Single Belt.	Double Belt.	
42	9	Created.....	\$17 70	\$19 85	50	22	Capillose.....	\$62 00	\$72 80	
	10	Creation.....	19 55	21 85		24	Capolado.....	69 00	80 80	
	11	Creature.....	21 25	23 85	52	6	Cappadine.....	19 60	22 00	
	12	Creche.....	23 35	26 00		7	Capreolus.....	21 60	24 10	
	14	Credence.....	27 50	31 20		8	Caprizant.....	23 80	26 50	
	16	Credulity.....	32 50	36 40		9	Capricum.....	24 90	28 00	
	18	Credulous.....	37 50	41 80		10	Capuchin.....	26 75	31 30	
	20	Creole.....	42 50	47 30		11	Carabineer.....	28 85	33 70	
44	3	Crepine.....	8 95	9 80	54	12	Carditis.....	30 95	36 40	
	4	Crested.....	10 35	11 40		14	Caressing.....	38 00	44 20	
	5	Crestless.....	11 90	13 15		16	Carenage.....	45 10	52 40	
	6	Crevice.....	13 50	15 00		18	Carestia.....	52 20	60 60	
	7	Cribbage.....	15 30	17 00		20	Carillon.....	59 40	68 90	
	8	Cribble.....	17 10	19 00		22	Carling.....	66 75	77 30	
	9	Cricket.....	18 90	21 00		24	Carlingue.....	74 10	85 90	
	10	Crimson.....	20 75	23 00		56	6	Carlsh.....	21 30	24 00
	11	Cringing.....	22 50	25 00			7	Carnivora.....	23 50	26 20
	12	Crispness.....	24 60	27 20			8	Carnosity.....	26 00	28 50
	14	Critical.....	29 30	33 00			9	Carotid.....	27 30	31 50
	16	Criticize.....	34 50	38 80			10	Carpel.....	28 90	34 20
18	Croaking.....	39 80	44 80	11	Carpentry.....		31 65	36 90		
20	Crockery.....	45 40	51 00	12	Carpillon.....		33 85	39 60		
46	3	Crocus.....	9 40	10 30	58		14	Carpingly.....	41 40	48 00
	4	Croft.....	10 95	12 05			16	Carpology.....	48 75	56 60
	5	Croftage.....	12 60	13 85			18	Cartabon.....	56 15	65 20
	6	Crooked.....	14 30	15 55			20	Cartage.....	63 80	73 90
	7	Croslet.....	16 10	17 30			22	Cartulary.....	71 50	82 80
	8	Crossbow.....	17 95	19 90		24	Carrefour.....	79 20	91 80	
	9	Crossing.....	19 75	22 00		60	6	Cartonnage.....	23 10	26 00
	10	Crossness.....	21 60	24 10			7	Carvement.....	25 50	28 40
	11	Croup.....	23 50	26 20			8	Caryatid.....	28 05	31 20
	12	Croupier.....	25 60	28 40			9	Casadero.....	29 60	34 10
	14	Crowbar.....	30 90	34 60			10	Casamuro.....	31 80	37 00
	16	Crowded.....	36 50	40 80			11	Caserner.....	34 35	39 90
18	Crowing.....	42 20	47 10	12	Caseworm.....		36 90	43 00		
20	Crowning.....	48 10	53 70	14	Casimbas.....		44 60	51 90		
48	3	Crowsfoot.....	9 85	10 80	62		16	Cassation.....	52 40	60 60
	4	Cruchon.....	11 50	12 70			18	Casserole.....	60 30	69 90
	5	Crucial.....	13 30	14 70			20	Cassideous.....	68 20	79 00
	6	Crucible.....	15 10	16 75			22	Castellan.....	76 20	88 10
	7	Crucifix.....	16 90	18 85		24	Castigator.....	84 30	97 30	
	8	Crude.....	18 80	21 00		64	6	Castrel.....	24 90	28 00
	9	Crudity.....	20 70	23 20			7	Catadupe.....	27 40	30 60
	10	Cruelly.....	22 60	25 45			8	Catalectes.....	30 30	33 60
	11	Crumbs.....	24 60	27 75			9	Cataleptis.....	32 00	36 70
	12	Crumble.....	26 70	30 15			10	Catalogize.....	34 40	39 90
	14	Crumpet.....	32 50	36 40			11	Catalufa.....	37 10	43 10
	16	Crunch.....	38 60	43 20			12	Cataplast.....	39 90	46 30
18	Crupper.....	44 80	50 20	14	Catechize.....		48 00	55 60		
20	Cruset.....	52 00	58 10	16	Catenation.....		56 20	65 00		
50	6	Cantalite.....	18 30	20 00	66		18	Cathartist.....	64 40	74 50
	7	Cantation.....	19 60	21 70			20	Catlinite.....	72 60	84 00
	8	Cantatory.....	21 90	24 00			22	Catopric.....	80 90	93 60
	9	Cantilene.....	22 60	26 30		24	Catsmeat.....	89 20	103 20	
	10	Cantiner.....	24 30	28 60		68	6	Caulescent.....	26 70	30 00
	11	Cantonada.....	26 15	30 90			7	Cauline.....	29 40	32 70
	12	Capability.....	28 05	33 20			8	Causation.....	32 60	35 90
	14	Capacete.....	34 75	41 00			9	Causeway.....	34 40	39 30
	16	Capachero.....	41 40	48 80			10	Cavadura.....	37 20	42 70
	18	Caparison.....	48 10	56 80			11	Calcade.....	40 10	46 20
	20	Caperuza.....	55 00	64 80						

For additional prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.  
Cipher for Bóres, Key-seats, etc., on page 17.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
60	13	Cavation.....	\$43 00	\$49 70	68	12	Chantress.....	\$58 50	\$68 00
	14	Cavernous.....	51 40	59 40		14	Chaology.....	68 50	80 00
	16	Cavicorn.....	59 90	69 40		16	Chapeau.....	79 00	92 00
	18	Ceaseless.....	68 50	79 40		18	Chaperon.....	90 50	105 00
	20	Cebadero.....	77 10	89 40		20	Chapfallen.....	102 00	118 00
	22	Cecity.....	85 70	99 40		22	Charcutter.....	112 50	131 00
	24	Cedratie.....	94 30	109 40		24	Chariness.....	123 00	144 00
63	6	Ceinture.....	33 00	36 00		26	Charitable.....	134 50	158 00
	7	Celature.....	36 00	40 00		28	Charloteer.....	147 00	172 00
	8	Celabrity.....	39 50	44 00		30	Charlatan.....	159 50	186 00
	9	Celestial.....	43 00	48 50	70	6	Charmingly.....	38 75	43 00
	10	Cellarage.....	46 50	53 00		7	Charmless.....	41 75	47 00
	11	Celitude.....	50 00	57 50		8	Charterist.....	45 25	51 00
	12	Celticism.....	54 00	62 50		9	Chasable.....	48 75	55 00
	14	Celtique.....	62 50	73 50		10	Chastener.....	52 25	59 00
	16	Celtish.....	71 00	82 50		11	Chasteness.....	55 75	64 00
	18	Cenacle.....	79 50	92 50		12	Chastise.....	60 00	70 00
	20	Cendreau.....	88 25	102 50		14	Chatelain.....	71 00	82 00
	22	Cenobie.....	97 00	113 00		16	Chatterbox.....	82 00	95 00
	24	Cenobite.....	106 00	124 00		18	Chattering.....	93 50	108 00
	26	Cenotaph.....	116 50	136 00		20	Cheapening.....	105 50	122 00
	28	Censorship.....	127 00	149 00		22	Cheapness.....	117 50	136 00
	30	Centaury.....	138 00	162 00		24	Cheatingly.....	129 50	150 00
64	6	Centella.....	34 25	38 00		26	Checkless.....	141 50	164 00
	7	Centinode.....	37 25	42 00		28	Checkmate.....	154 00	179 00
	8	Centralism.....	40 75	46 00		30	Cheeringly.....	166 50	194 00
	9	Central.....	44 25	50 00	72	6	Cheerless.....	40 25	45 00
	10	Cephalic.....	47 75	54 50		7	Cheesecake.....	43 75	49 00
	11	Ceraceous.....	51 25	59 00		8	Chemim.....	48 25	54 00
	12	Cerafolio.....	55 60	65 00		9	Chemistry.....	51 75	59 00
	14	Cerasite.....	64 30	75 00		10	Chequered.....	55 75	64 00
	16	Cercado.....	73 80	85 00		11	Chercher.....	60 50	70 00
	18	Cercean.....	83 30	96 00		12	Cherishing.....	66 00	76 00
	20	Cerebral.....	92 80	108 00		14	Chessboard.....	77 00	89 00
	22	Cerecloth.....	103 00	120 00		16	Chevalier.....	88 00	102 00
	24	Cerement.....	113 20	132 00		18	Chevreau.....	99 00	115 00
	26	Ceremonial.....	123 50	144 00		20	Chewing.....	110 00	129 00
	28	Certitude.....	134 00	157 00		22	Chieftdom.....	122 00	143 00
	30	Cerulean.....	145 50	170 00		24	Chieftain.....	134 00	157 00
66	6	Cerulific.....	35 75	40 00		26	Chilblain.....	147 00	171 00
	7	Gerumen.....	38 75	44 00		28	Childhood.....	160 00	186 00
	8	Cervelet.....	42 25	48 00		30	Childish.....	173 00	201 00
	9	Cesarean.....	45 75	52 00		32	Childlike.....	186 00	216 00
	10	Cespitous.....	49 25	56 50		34	Chillid.....	199 00	232 00
	11	Cessant.....	52 75	61 00		36	Chilliness.....	212 00	248 00
	12	Chaborra.....	57 00	67 00	74	8	Chink.....	58 00	67 00
	14	Chafallon.....	66 50	77 50		9	Chipping.....	62 00	72 00
	16	Chaffinch.....	76 50	88 50		10	Chirolgy.....	67 00	77 00
	18	Chaffless.....	86 50	100 50		11	Chiselling.....	72 00	83 00
	20	Chainette.....	96 50	112 50		12	Chivalrous.....	77 00	89 00
	22	Chairman.....	107 00	124 50		14	Chivalry.....	87 00	100 00
	24	Chaland.....	117 00	136 50		16	Chocador.....	97 00	112 00
	26	Chainwork.....	127 30	149 00		18	Choiceless.....	107 00	124 00
	28	Chameleon.....	138 00	162 00		20	Choking.....	117 00	136 00
	30	Champerty.....	152 00	178 00		22	Chomage.....	127 00	148 00
68	6	Chancellor.....	37 25	41 50		24	Choralist.....	138 00	160 00
	7	Chanfrein.....	40 25	45 00		26	Chorister.....	150 00	173 00
	8	Changeable.....	43 75	49 00		28	Chrisem.....	162 00	188 00
	9	Changeful.....	47 25	53 00		30	Chrismal.....	174 00	203 00
	10	Chantable.....	50 75	57 50		32	Christened.....	186 00	218 00
	11	Chantism.....	54 25	62 00		34	Chronic.....	199 00	233 00
						36	Chuckling.....	212 00	248 00

For additional prices for Split and Tight-and-Loose Pulleys, see pages 33 and 34.  
 Cipher for Bore, Key-seats, etc., on page 17.



Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
76	8	Chuffily.....	\$62 00	\$72 00	82	22	Coalery.....	\$150 00	\$175 00
	9	Churnie.....	66 00	77 00		24	Coaliser.....	163 00	191 00
	10	Chump.....	71 00	83 00		26	Coaltar.....	178 00	208 00
	11	Churching.....	76 00	89 00		28	Coarseness.....	193 00	225 00
	12	Churchship.....	81 00	95 00		30	Cochon.....	208 00	242 00
	14	Churchyard.....	91 00	106 00		32	Cockatoo.....	223 00	260 00
	16	Churning.....	101 00	117 00		34	Cockboat.....	238 00	278 00
	18	Chyle.....	111 00	128 00		36	Cockled.....	253 00	296 00
	20	Chymify.....	121 00	140 00	84	8	Cockloft.....	79 00	92 00
	22	Cierge.....	131 00	153 00		9	Cockspur.....	83 00	97 00
	24	Citiate.....	143 00	168 00		10	Coctible.....	88 00	102 00
	26	Cillement.....	156 00	183 00		11	Codicil.....	93 00	108 00
	28	Cimolite.....	169 00	198 00		12	Codling.....	98 00	114 00
	30	Cindery.....	182 00	213 00		14	Coerce.....	108 00	126 00
	32	Cininary.....	196 00	228 00		16	Coercion.....	120 00	140 00
	34	Cinnabar.....	210 00	244 00		18	Coeval.....	132 00	154 00
	36	Ciphering.....	224 00	260 00		20	Cofferer.....	145 00	169 00
78	8	Cirage.....	66 00	77 00		22	Cogitate.....	158 00	184 00
	9	Circumter.....	70 00	82 00		24	Cognomen.....	171 00	199 00
	10	Cisalpine.....	75 00	88 00		26	Cohabit.....	185 00	216 00
	11	Ciseau.....	80 00	93 00		28	Cohesion.....	201 00	234 00
	12	Ciseleur.....	85 00	99 00		30	Coiled.....	217 00	252 00
	14	Citation.....	95 00	110 00		32	Coincide.....	233 00	271 00
	16	Civet.....	105 00	123 00		34	Coistril.....	249 00	290 00
	18	Civilian.....	116 00	136 00		36	Colarim.....	265 00	309 00
	20	Claimant.....	127 00	149 00	90	8	Colation.....	85 00	99 00
	22	Clameur.....	139 00	162 00		9	Coldness.....	91 00	106 00
	24	Clamorous.....	151 00	177 00		10	Colewort.....	97 00	113 00
	26	Clamping.....	164 00	192 00		11	Colical.....	103 00	120 00
	28	Clancular.....	178 00	207 00		12	Collared.....	109 00	127 00
	30	Clank.....	192 00	223 00		14	Collate.....	122 00	142 00
	32	Clansman.....	206 00	239 00		16	Collide.....	135 00	157 00
	34	Classic.....	220 00	256 00		18	Colonist.....	148 00	173 00
	36	Classical.....	234 00	273 00		20	Colorist.....	162 00	189 00
80	8	Clavated.....	70 00	82 00		22	Colossus.....	176 00	206 00
	9	Clavicle.....	74 00	87 00		24	Coltish.....	190 00	223 00
	10	Clayish.....	79 00	93 00		26	Coltsfoot.....	207 00	242 00
	11	Claymore.....	84 00	99 00		28	Comate.....	224 00	262 00
	12	Cleanness.....	90 00	105 00		30	Combien.....	241 00	283 00
	14	Clematis.....	100 00	116 00		32	Combler.....	259 00	304 00
	16	Clergical.....	110 00	129 00		34	Comedian.....	277 00	325 00
	18	Clerkship.....	121 00	142 00		36	Comfiture.....	295 00	346 00
	20	Cleverly.....	133 00	155 00	96	8	Comical.....	91 00	106 00
	22	Clement.....	145 00	169 00		9	Comique.....	98 00	114 00
	24	Climbing.....	157 00	183 00		10	Comity.....	105 00	122 00
	26	Clincher.....	171 00	199 00		11	Commotion.....	112 00	130 00
	28	Clinical.....	185 00	216 00		12	Conchite.....	120 00	140 00
	30	Clockcase.....	199 00	233 00		14	Concordist.....	135 00	157 00
	32	Clockman.....	214 00	250 00		16	Conditng.....	150 00	175 00
	34	Clodpate.....	229 00	267 00		18	Consolate.....	165 00	193 00
	36	Clodpole.....	244 00	284 00		20	Constantly.....	180 00	211 00
82	8	Closeness.....	74 00	87 00		22	Contund.....	195 00	229 00
	9	Clouded.....	79 00	92 00		24	Convocate.....	211 00	247 00
	10	Clownish.....	84 00	98 00		26	Convolute.....	230 00	269 00
	11	Cloyment.....	89 00	104 00		28	Cooing.....	250 00	292 00
	12	Clubber.....	94 00	110 00		30	Copier.....	270 00	315 00
	14	Clubbish.....	104 00	121 00		32	Corumba.....	290 00	338 00
	16	Clustering.....	115 00	134 00		34	Cosaque.....	310 00	361 00
	18	Coachman.....	126 00	147 00		36	Covenant.....	330 00	384 00
	20	Coaction.....	138 00	161 00					

Prices of Pulleys of larger dimensions than listed furnished on application.  
For additional prices for Split and Tight-and-Loose Pulleys see pages 33 and 34.  
Cipher for Bores, Key-seats, etc., on page 17.



# SPLIT PULLEYS.

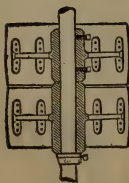
Additional List Prices to be added to List Prices of all Whole Pulleys.

For List of Wrought Rim Whole Pulleys, see Pages 17 to 25, for Cast Pulleys, Pages 26 to 32.

SEE CUT No. 9.



Face..	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30	32	34	36
Diameter.																						
6 to 11	\$1 00	\$1 15	\$1 25	\$1 45	\$1 50	\$1 75	\$1 90	\$2 05	\$2 35	\$2 50	\$2 65	\$2 80										
12 to 17	1 05	1 20	1 35	1 50	1 55	1 85	2 05	2 20	2 40	2 75	3 05	3 40	\$3 75	\$4 00	\$4 30	\$4 80	\$5 40					
18 to 24	1 15	1 35	1 55	1 70	1 85	2 05	2 25	2 40	2 60	3 10	3 40	3 75	4 25	4 75	5 25	5 80	6 45	7 05				
25 to 27	1 25	1 45	1 65	1 85	2 05	2 25	2 50	2 80	3 10	3 40	3 75	4 25	4 75	5 25	5 75	6 35	7 00	7 60	\$8 25			
28 to 31	1 45	1 65	1 85	2 10	2 35	2 60	2 85	3 10	3 40	3 70	4 05	4 60	5 10	5 70	6 35	7 00	7 60	8 25	\$8 90			
32 to 36	1 70	1 90	2 10	2 35	2 60	2 85	3 15	3 45	3 70	4 00	4 50	5 10	5 75	6 40	7 05	7 70	8 40	9 10	9 90			
37 to 40	.....	2 40	2 60	2 90	3 15	3 40	3 70	4 00	4 30	4 60	5 15	5 70	6 50	7 20	7 90	8 60	9 30	10 00	10 70			
41 to 44	.....	2 90	3 10	3 40	3 60	3 80	4 10	4 40	4 70	5 00	5 60	6 35	7 05	7 90	8 70	9 50	10 30	11 10	12 10			
45 to 48	.....	3 30	3 50	3 70	3 90	4 20	4 60	4 90	5 30	5 70	6 50	7 30	8 10	9 00	9 90	10 80	11 70	12 70	13 80			
50 to 52	.....	.....	.....	.....	4 10	4 30	4 75	5 10	5 50	5 90	6 30	7 00	7 80	8 70	9 60	10 50	11 40	12 30	13 30	\$15 40	\$16 50	\$17 60
54 to 56	.....	.....	.....	.....	4 50	4 80	5 20	5 60	6 00	6 40	6 80	7 60	8 40	9 30	10 30	11 30	12 30	13 30	14 30	15 30	16 40	17 50
58 to 60	.....	.....	.....	.....	4 90	5 20	5 75	6 15	6 55	6 95	7 35	8 10	9 10	10 10	11 10	12 10	13 10	14 20	15 40	16 60	17 80	19 00
62 to 64	.....	.....	.....	.....	5 30	5 60	6 10	6 50	7 00	7 45	7 90	8 70	9 70	10 70	11 70	12 70	13 70	14 90	16 20	17 30	18 70	20 00
66 to 68	.....	.....	.....	.....	5 70	6 00	6 45	6 85	7 30	7 75	8 20	9 10	10 10	11 10	12 20	13 30	14 40	15 70	16 90	18 10	19 50	20 90
70 to 72	.....	.....	.....	.....	6 10	6 40	6 90	7 35	7 80	8 25	9 00	9 80	10 90	12 00	13 20	14 40	15 60	16 90	18 10	19 50	20 90	22 40
74 to 76	.....	.....	.....	.....	6 50	6 80	7 30	7 85	8 25	8 70	9 20	10 30	11 50	12 70	13 95	15 20	16 70	18 30	19 90	21 60	23 30	24 50
78 to 80	.....	.....	.....	.....	.....	.....	7 80	8 25	8 70	9 15	9 70	10 80	12 10	13 40	14 60	15 90	17 30	19 10	20 80	22 40	24 10	25 90
82 to 84	.....	.....	.....	.....	.....	.....	8 30	8 80	9 30	9 80	10 40	11 50	13 00	14 40	15 80	17 30	19 10	20 90	22 60	24 30	26 20	28 00
86 to 88	.....	.....	.....	.....	.....	.....	9 00	9 50	10 00	10 60	11 30	12 30	13 70	15 30	17 00	18 60	20 20	22 00	23 70	25 50	27 30	29 30
90 to 92	.....	.....	.....	.....	.....	.....	9 80	10 30	10 80	11 50	12 30	13 20	14 60	16 10	17 80	19 50	21 10	22 90	24 60	26 50	28 30	30 40
94 to 96	.....	.....	.....	.....	.....	.....	10 70	11 20	11 70	12 40	13 10	14 00	15 50	17 00	18 70	20 40	22 00	23 80	25 60	27 50	29 40	31 50
Face..	3	4	5	6	7	8	9	10	11	12	14	16	18	20	22	24	26	28	30	32	34	36



## PLAIN TIGHT-AND-LOOSE PULLEYS.

Additional list prices per pair to be added to list prices of Whole Pulleys.

For list of Wrought Rim Whole Pulleys see pages 17 to 25. For Cast Iron Pulleys pages 26 to 32.

Face.	3	4	5	6	7	8	9	10	11	12
Bore.										
1 3/16 .....	\$0 80	\$1 10	\$1 40	\$1 70	\$2 00	\$2 30	\$2 60	\$2 90	\$3 20	\$3 50
1 7/16 .....	95	1 25	1 60	1 95	2 30	2 65	2 90	3 25	3 60	3 95
1 11/16 .....	1 15	1 45	1 80	2 15	2 50	2 85	3 20	3 55	3 90	4 30
1 15/16 .....	1 30	1 65	2 00	2 35	2 70	3 05	3 40	3 75	4 20	4 70
2 3/16 .....	1 45	1 80	2 20	2 65	3 10	3 55	4 00	4 45	4 90	5 35
2 7/16 .....	1 60	2 05	2 50	2 95	3 40	3 85	4 30	4 75	5 20	5 65
2 11/16 .....	1 80	2 25	2 70	3 15	3 60	4 05	4 50	4 95	5 40	5 90
2 15/16 .....	2 05	2 50	2 95	3 45	3 95	4 45	4 95	5 45	5 95	6 45

## SLEEVES FOR LOOSE PULLEYS.

These prices to be added to prices of Wrought Rim or Cast Iron Whole Pulleys.

Bore.....	13/16	17/16	11/16	15/16	23/16	27/16	21/16	25/16	33/16	37/16	31/16	35/16
Cipher.....	Deker	Deckman	Degraw	Daibel	Dancer	Dapple	Dawn	Debased	Deceler	Deduce	Degrade	Denur
"	Delos	Denimier	Denison	Denton	Desmond	Darken	Deadeye	Debtor	Decency	Deepness	Degree	Denial
"	Deltmar	Devine	Devlin	Devo	Dickson	Darkness	Dealer	Decant	Decoy	Deface	Defect	Denizen
"	Dollard	Donnell	Donovan	Dorrance	Dover	Dowling	Dress	Drummond	Deception	Default	Delegate	Denote
"	Duckwell	Dudley	Duffer	Dagger	Dumas	Dunham	Dunlevy	Duquoin	Decide	Defeat	Delight	Depart
"	Durand	Durgan	Durkee	Duross	Dwyer	Eaton	Eggers	Elleard	Decline	Defiance	Deliver	Depend
"	"	"	"	Ellison	Elwood	Emanuel	Emmons	Empire	Decorate	Defiance	Delude	Deplete
"	"	"	"	Damago	4 10	5 75	Ettenger	Eyerson	Decorum	Deform	Delusion	Deport
"	"	"	"	Damper	Dandruif	Esher	Ettenger	Eyerson	Decorum	Deform	Delusion	Deport
"	"	"	"	4 75	5 40	6 50	Ewald	Fairbank	Decoy	Defray	Delusion	Deport
"	"	"	"	"	"	7 50	Daughter	Farnham	Decrease	Defy	Demand	Deposit
"	"	"	"	"	"	"	Fallons	Farnham	Decrease	Defy	Demand	Deposit
"	"	"	"	"	"	"	"	"	Dedicate	Demagogue	Democrat	Depraved
"	"	"	"	"	"	"	"	"	Deceit	Demagogue	Democrat	Depraved
"	"	"	"	"	"	"	"	"	11 50	14 50	16 00	17 75

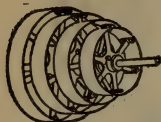
We furnish sleeves two inches longer than face of pulley unless otherwise ordered. Outside diameter is  $\frac{1}{8}$  inch larger than bore.  
For price on split sleeves, add 20 per cent to lists above mentioned.

## FLANGE PULLEYS.

Diameter, Inches....	4 to 5	6 to 8	9 to 10	11 to 12	13 to 16	17 to 20	21 to 24	25 to 28	29 to 32	33 to 36	37 to 40	41 to 44	45 to 48
Height of Flange, In..	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	1	1	1
Upper .....	Begulle	Behavior	Behest	Belabor	Belfry	Bellman	Bemoan	Cabinet	Caboose	Cadet	Caldron	Callous	Calumny
Price for Each Flange..	\$0 95	1 40	3 20	3 85	4 25	4 75	5 20	5 85	6 35	6 80	8 00	9 00	10 75

Above prices to be added to prices of plain pulleys and apply to flanges in center or on edge of pulley.





# CONE PULLEYS.

These prices are for single pulleys. In figuring price on Cone complete, add together the prices of the various pulleys composing the Cone.

Pulleys under 8 inches diameter will be furnished of cast iron.

Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
4	2	Sampson.....	\$2 00	\$2 35	9	6	Stratford.....	\$4 95	\$5 65
	2½	Sanborn.....	2 05	2 40	10	2	Stratton.....	3 90	4 50
	3	Sanders.....	2 15	2 50		2½	Strawn.....	4 00	4 60
5	3	Sandoval.....	2 05	2 55		3	Streator.....	4 15	4 70
	3½	Sanford.....	2 15	2 65		3½	Stribling.....	4 25	4 85
	4	Saratoga.....	2 25	2 75		4	Strong.....	4 40	5 00
	4½	Scranton.....	2 50	2 90		4½	Strum.....	4 55	5 20
6	4	Scudder.....	2 75	3 10		5	Stubbs.....	4 75	5 45
	4½	Sedgwick.....	2 15	2 70		5½	Sublett.....	4 95	5 65
	5	Selkirk.....	2 30	2 80		6	Success.....	5 15	5 90
	5½	Selma.....	2 45	2 95	11	2	Sudley.....	4 00	4 75
	6	Seneca.....	2 70	3 15		2½	Suffolk.....	4 15	4 85
	6½	Seward.....	2 95	3 25		3	Sugar.....	4 30	5 00
	7	Shannon.....	3 10	3 45		3½	Sumac.....	4 50	5 20
	7½	Shelby.....	3 25	3 70		4	Summers.....	4 70	5 45
	8	Shiloh.....	3 45	3 90		4½	Summitt.....	4 85	5 70
	8½	Simmons.....	3 70	4 15		5	Sumpter.....	5 05	5 95
7	2	Simpkins.....	2 30	3 00		5½	Sunset.....	5 20	6 10
	2½	Silgo.....	2 45	3 10		6	Surbon.....	5 40	6 30
	3	Sloans.....	2 05	3 20	12	2	Surf.....	4 20	5 00
	3½	Solomon.....	2 90	3 45		2½	Surrey.....	4 35	5 15
	4	Sonora.....	3 20	3 55		3	Susan.....	4 50	5 30
	4½	Sparta.....	3 35	3 75		3½	Sutter.....	4 70	5 50
	5	Spencer.....	3 55	3 95		4	Sutton.....	4 90	5 75
	5½	Stanton.....	3 75	4 25		4½	Swain.....	5 15	6 00
	6	Stella.....	3 95	4 55		5	Swales.....	5 40	6 30
8	2	Sterling.....	3 35	4 00		5½	Swamp.....	5 55	6 50
	2½	Stewart.....	3 55	4 10		6	Swans.....	5 70	6 70
	3	Stiles.....	3 75	4 20	13	2½	Swanton.....	4 50	5 50
	3½	Stillmore.....	3 85	4 35		3	Swarts.....	4 70	5 65
	4	Stillwell.....	4 00	4 50		3½	Sweet.....	4 90	5 85
	4½	Stilton.....	4 20	4 70		4	Swift.....	5 15	6 05
	5	Stilts.....	4 40	4 90		4½	Swine.....	5 40	6 20
	5½	Stinson.....	4 55	5 15		5	Switch.....	5 65	6 65
	6	Stocking.....	4 75	5 40		5½	Switzer.....	5 80	6 80
9	2	Stocks.....	3 50	4 15		6	Sylvia.....	6 00	7 00
	2½	Stockton.....	3 70	4 25	14	2½	Tabor.....	5 00	5 80
	3	Stokley.....	3 95	4 40		3	Tacoma.....	5 15	6 00
	3½	Stone.....	4 05	4 55		3½	Tadmor.....	5 30	6 20
	4	Storage.....	4 20	4 75		4	Tadpole.....	5 45	6 40
	4½	Stovall.....	4 35	4 95		4½	Tafts.....	5 65	6 65
	5	Strand.....	4 55	5 15		5	Taggart.....	5 90	6 95
	5½	Stranger.....	4 75	5 40		5½	Taintor.....	6 05	7 10

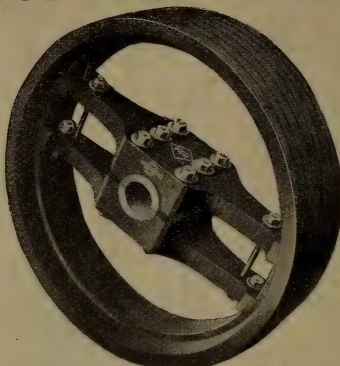


Diameter.	Face.	CIPHER.	PRICE.		Diameter.	Face.	CIPHER.	PRICE.	
			Single Belt.	Double Belt.				Single Belt.	Double Belt.
14	6	Talbot .....	\$6 25	\$7 30	19	5½	Todd .....	\$7 50	\$9 05
15	2½	Talcott .....	5 05	6 10		6	Tompkins .....	7 80	9 40
	3	Tallman .....	5 30	6 30	20	3	Topaz .....	6 45	7 90
	3½	Tally .....	5 45	6 50		3½	Tornado .....	6 65	8 20
	4	Talmadge .....	5 65	6 75		4	Toronto .....	6 90	8 50
	4½	Tampa .....	5 90	7 00		4½	Towers .....	7 20	8 75
	5	Tampico .....	6 15	7 25		5	Townsend .....	7 50	9 05
	5½	Tanbark .....	6 35	7 40		5½	Tracy .....	7 80	9 45
16	6	Tarboro .....	6 55	7 55		6	Trader .....	8 15	9 90
	2½	Tariff .....	5 35	6 50	21	3	Transit .....	6 65	8 15
	3	Taswell .....	5 55	6 70		3½	Trapp .....	6 85	8 40
	3½	Taunton .....	5 70	6 85		4	Tredway .....	7 10	8 65
	4	Tavern .....	5 90	7 00		4½	Trenton .....	7 45	9 00
	4½	Taylor .....	6 15	7 25		5	Trigg .....	7 65	9 40
	5	Tecumseh .....	6 40	7 55		5½	Trinity .....	8 10	9 85
	5½	Temple .....	6 65	7 80		6	Triumph .....	8 55	10 45
	6	Tennis .....	6 90	8 05	22	3	Trotter .....	6 80	8 45
17	2½	Terrace .....	5 50	6 70		3½	Trout .....	7 00	8 70
	3	Textile .....	5 75	6 95		4	Troy .....	7 25	9 00
	3½	Thatcher .....	5 90	7 10		4½	Tubbs .....	7 65	9 35
	4	Thayer .....	6 05	7 30		5	Tucker .....	8 05	9 70
	4½	Thistle .....	6 35	7 60		5½	Tulip .....	8 45	10 30
	5	Thomas .....	6 65	7 90		6	Tunnel .....	8 90	10 90
	5½	Thornton .....	6 90	8 15	23	3	Turner .....	7 05	8 70
	6	Thrall .....	7 20	8 45		3½	Turtle .....	7 35	9 05
18	2½	Thrift .....	5 65	6 90		4	Tweed .....	7 65	9 40
	3	Thurman .....	5 95	7 20		4½	Twins .....	7 90	9 75
	3½	Tibbets .....	6 10	7 45		5	Udell .....	8 40	10 15
	4	Tidal .....	6 30	7 70		5½	Ulman .....	8 80	10 40
	4½	Tiffany .....	6 60	8 00		6	Ulster .....	9 25	11 20
	5	Tiger .....	6 90	8 40	24	3	Ulysses .....	7 30	9 00
	5½	Tilden .....	7 20	8 70		3½	Uncas .....	7 70	9 40
	6	Tilton .....	7 50	9 00		4	Uncle .....	8 15	9 80
19	3	Timothy .....	6 25	7 55		4½	Undine .....	8 50	10 30
	3½	Tipton .....	6 45	7 80		5	Unicorn .....	8 90	10 75
	4	Titcomb .....	6 65	8 05		5½	Union .....	9 30	11 15
	4½	Tivoli .....	6 95	8 40		6	Unity .....	9 70	11 55
	5	Tobias .....	7 25	8 75					

## CAST IRON BUSHES—FOR PULLEYS.

Bore.	Outside Diameter, Inch.	17/16	111/16	115/16	23/16	27/16	211/16
	Inside Diameter, Inch.	13/16 to 1	17/16 to 1	111/16 to 13/16	115/16 to 17/16	23/16 to 111/16	21/4 to 111/16
	Solid—Price, Per Pair....	\$ 0 42	0 46	0 53	0 60	0 68	0 86
	Split—Price, Per Pair....	\$ 0 50	0 54	0 61	0 77	0 84	1 05
Bore.	Outside Diameter, Inch.....	215/16	33/16	37/16	311/16	315/16	
	Inside Diameter, Inch.....	21/2 to 115/16	211/16 to 23/16	3 to 27/16	33/16 to 211/16	37/16 to 27/8	
	Solid—Price, Per Pair.....	\$ 1 06	1 40	1 70	1 85	2 10	
	Split—Price, Per Pair.....	\$ 1 36	1 70	2 10	2 35	2 60	

## WOOD SPLIT PULLEYS



WITH PATENT

STANDARDIZED

PUSHING SYSTEM.

DOUBLE

BELT CAPACITY.

## COMPLETE REVISED PRICE LIST.

March 1, 1897.

Diam. Face.			Diam. Face.			Diam. Face.			Diam. Face.			Diam. Face.			Diam. Face.			Diam. Face.		
In.	In.	Price.	In.	In.	Price.	In.	In.	Price.	In.	In.	Price.	In.	In.	Price.	In.	In.	Price.	In.	In.	Price.
3	2	1.80	6	7	3.00	9	13	5.40	12	9	4.90	14	16	9.10	16	19	12.60	18	18	13.50
3	3	1.90	8	8	3.25	14	15	5.80	10	10	5.20	17	17	9.70	20	20	13.40	19	19	14.30
4	4	2.00	9	9	3.50	15	16	6.20	11	11	5.70	18	18	10.40	21	21	14.20	20	20	15.20
5	5	2.10	10	10	3.75	16	17	6.60	12	12	6.10	19	19	11.10	22	22	15.10	21	21	16.10
6	6	2.25	11	11	4.00	17	18	7.00	13	13	6.50	20	20	11.80	23	23	16.00	22	22	17.00
7	7	2.40	12	12	4.30	18	19	7.50	14	14	6.90	21	21	12.60	24	24	16.80	23	23	17.90
8	8	2.60	13	13	4.65	19	20	8.00	15	15	7.40	22	22	13.40	25	25	17.80	24	24	19.00
9	9	2.85	14	14	5.00	20	21	8.50	16	16	7.90	23	23	14.20	26	26	18.80	25	25	20.10
10	10	3.10	15	15	5.35				17	17	8.50	24	24	15.00	28	28	20.80	26	26	21.20
11	11	3.35	16	16	5.70	10	3	2.80	18	18	9.10				30	30	23.00	28	28	23.50
12	12	3.60				4	4	3.00	19	19	9.70	15	3	3.60				30	30	26.00
13	13	3.85	7	2	2.20	5	5	3.25	20	20	10.40	4	4	3.90	17	3	4.00			
14	14	4.10	3	3	2.30	6	6	3.50	21	21	11.10	5	5	4.25	4	4	4.40	19	3	4.40
15	15	4.40	4	4	2.45	7	7	3.75	22	22	11.80	6	6	4.60	5	5	4.90			
16	16	4.75	5	5	2.65	8	8	4.00	23	23	12.60	7	7	5.00	6	6	5.40			
			6	6	2.85	9	9	4.30	24	24	13.40	8	8	5.45	7	7	5.90	6	6	5.90
4	2	1.90	7	7	3.10	10	10	4.65				9	9	5.90	8	8	6.40	7	7	6.50
3	3	2.00	8	8	3.35	11	11	5.00	13	3	3.30	10	10	6.35	9	9	6.90	8	8	7.10
4	4	2.10	9	9	3.60	12	12	5.40	4	4	3.55	11	11	6.80	10	10	7.40	9	9	7.70
5	5	2.20	10	10	3.85	13	13	5.80	5	5	3.80	12	12	7.30	11	11	7.90	10	10	8.30
6	6	2.40	11	11	4.15	14	14	6.20	6	6	4.10	13	13	7.80	12	12	8.40	11	11	8.90
7	7	2.60	12	12	4.50	15	15	6.60	7	7	4.45	14	14	8.40	13	13	8.90	12	12	9.50
8	8	2.85	13	13	4.85	16	16	7.00	8	8	4.80	15	15	9.00	14	14	9.50	13	13	10.20
9	9	3.10	14	14	5.20	17	17	7.50	9	9	5.20	16	16	9.60	15	15	10.20	14	14	11.00
10	10	3.35	15	15	5.55	18	18	8.00	10	10	5.60	17	17	10.30	16	16	11.00	15	15	11.80
11	11	3.60	16	16	5.90	19	19	8.60	11	11	6.00	18	18	11.00	17	17	11.80	16	16	12.60
12	12	3.85				20	20	9.20	12	12	6.40	19	19	11.50	18	18	12.60	17	17	13.40
13	13	4.10	8	2	2.35				13	13	6.80	20	20	12.60	19	19	13.40	18	18	14.30
14	14	4.40	3	3	2.45	11	3	3.00	14	14	7.30	21	21	13.40	20	20	14.20	19	19	15.20
15	15	4.75	4	4	2.60	4	4	3.25	15	15	7.80	22	22	14.20	21	21	15.10	20	20	16.10
16	16	5.10	5	5	2.80	5	5	3.50	16	16	8.40	23	23	15.10	22	22	16.00	21	21	17.00
			6	6	3.00	6	6	3.75	17	17	9.00	24	24	16.00	23	23	16.90	22	22	17.90
5	2	2.00	7	7	3.25	7	7	4.00	18	18	9.60	25	25	16.90	24	24	17.80	23	23	19.00
3	3	2.10	8	8	3.50	8	8	4.30	19	19	10.30	26	26	17.80	25	25	18.80	24	24	20.10
4	4	2.20	9	9	3.75	9	9	4.65	20	20	11.00	28	28	19.80	26	26	19.90	25	25	21.20
5	5	2.40	10	10	4.00	10	10	5.00	21	21	11.70	30	30	21.80	28	28	22.10	26	26	22.30
6	6	2.60	11	11	4.30	11	11	5.40	22	22	12.50				30	30	24.50	28	28	24.80
7	7	2.85	12	12	4.65	12	12	5.80	23	23	13.30	16	3	3.80				30	30	27.50
8	8	3.10	13	13	5.00	13	13	6.20	24	24	14.10	4	4	4.15	18	3	4.20			
9	9	3.35	14	14	5.40	14	14	6.60				5	5	4.50	4	4	4.70	20	3	4.60
10	10	3.60	15	15	5.80	15	15	7.00	14	3	3.45	6	6	5.00	5	5	5.20			
11	11	3.85	16	16	6.20	16	16	7.50	4	4	3.70	7	7	5.50	6	6	5.80			
12	12	4.10				17	17	8.00	5	5	4.00	8	8	6.00	7	7	6.20			
13	13	4.40	9	3	2.60	18	18	8.60	6	6	4.35	9	9	6.50	8	8	6.70			
14	14	4.75	4	4	2.80	19	19	9.20	7	7	4.70	10	10	7.00	9	9	7.20			
15	15	5.10	5	5	3.00	20	20	9.80	8	8	5.10	11	11	7.50	10	10	7.80			
16	16	5.45	6	6	3.25				9	9	5.55	12	12	8.00	11	11	8.40			
			7	7	3.50	12	3	3.15	10	10	6.00	13	13	8.50	12	12	9.00			
6	2	2.10	8	8	3.75	4	4	3.40	11	11	6.45	14	14	9.00	13	13	9.60			
3	3	2.20	9	9	4.00	5	5	3.65	12	12	6.90	15	15	9.60	14	14	10.30			
4	4	2.35	10	10	4.30	6	6	3.90	13	13	7.40	16	16	10.30	15	15	11.10			
5	5	2.55	11	11	4.65	7	7	4.20	14	14	7.90	17	17	11.00	16	16	11.90			
6	6	2.75	12	12	5.00	8	8	4.55	15	15	8.50	18	18	11.80	17	17	12.70			

## WOOD SPLIT PULLEYS

PRICE LIST—Continued.

Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.
20 17 14.70 18 15.60 19 16.50 20 17.50 21 18.50 22 19.60 23 20.70 24 21.80 25 22.90 26 24.00 28 26.30 30 29.00	23 18 19.40 19 20.60 20 21.80 21 23.00 22 24.30 23 25.60 24 26.90 25 28.20 26 29.60 28 32.50 30 36.00	26 9 11.50 10 12.60 11 13.75 12 15.00 13 16.30 14 17.60 15 19.00 16 20.40 17 21.80 18 23.30 19 24.80 20 26.30 21 27.90 22 29.50 23 31.10 24 32.70 25 34.30 26 35.90 28 39.10 30 42.50 32 48.00 34 54.00 36 60.00 40 75.00	28 23 42.50 30 47.50 32 53.00 34 59.00 36 65.00 38 73.00 40 81.00	29 3 7.30 4 8.20 5 9.10 6 10.00 7 11.10 8 12.30 9 13.50 10 14.75 11 16.00 12 17.50 13 19.00 14 20.50 15 22.10 16 23.70 17 25.30 18 27.00 19 28.70 20 30.40 21 32.10 22 33.80 23 35.50 24 37.20 25 38.90 26 40.60 28 44.50 30 49.00 32 55.00 34 61.00 36 68.00 38 76.00 40 84.00	31 13 21.20 14 22.80 15 24.60 16 26.40 17 28.20 18 30.00 19 31.80 20 33.60 21 35.40 22 37.20 23 39.00 24 40.80 25 42.60 26 44.50 28 48.75 30 53.00 32 59.00 34 65.00 36 72.00 38 80.00 40 88.00	33 36 78.30 38 86.50 40 95.70	34 3 9.40 4 10.60 5 11.80 6 13.10 7 14.45 8 15.90 9 17.40 10 19.00 11 20.70 12 22.50 13 24.20 14 26.10 15 27.90 16 29.80 17 31.70 18 33.60 19 35.70 20 37.80 21 40.00 22 42.20 23 44.40 24 46.80 25 49.20 26 51.60 28 56.40 30 61.40 32 67.20 34 75.00 36 82.60 38 91.00 40 100.00
21 3 4.80 4 5.40 5 6.00 6 6.60 7 7.30 8 8.00 9 8.70 10 9.40 11 10.20 12 11.00 13 11.80 14 12.70 15 13.60 16 14.50 17 15.50 18 16.50 19 17.50 20 18.60 21 19.70 22 20.80 23 22.00 24 23.20 25 24.40 26 25.60 28 28.00 30 30.70	24 3 5.50 4 6.20 5 7.00 6 7.80 7 8.60 8 9.40 9 10.30 10 11.20 11 12.10 12 13.00 13 14.10 14 15.30 15 16.50 16 17.70 17 18.90 18 20.20 19 21.50 20 22.80 21 24.10 22 25.40 23 26.80 24 28.20 25 29.60 26 31.00 28 34.00 30 38.50 32 45.00 34 50.00 36 56.00 38 63.00 40 70.00	27 3 6.60 4 7.40 5 8.20 6 9.00 7 10.00 8 11.10 9 12.20 10 13.40 11 14.60 12 15.80 13 17.10 14 18.50 15 20.00 16 21.50 17 23.00 18 24.50 19 26.10 20 27.70 21 29.30 22 30.90 23 32.50 24 34.10 25 35.70 26 37.30 28 41.00 30 45.00 32 50.00 34 56.00 36 62.00 38 70.00 40 78.00	30 3 7.70 4 8.60 5 9.50 6 10.60 7 11.80 8 13.00 9 14.30 10 15.60 11 17.00 12 18.50 13 20.00 14 21.50 15 23.25 16 25.00 17 26.75 18 28.50 19 30.25 20 32.00 21 33.75 22 35.50 23 37.25 24 39.00 25 40.75 26 42.50 28 46.50 30 51.00 32 57.00 34 63.00 36 70.00 38 78.00 40 86.00	32 3 8.50 4 9.50 5 10.50 6 11.60 7 12.85 8 14.10 9 15.50 10 17.00 11 18.60 12 20.30 13 22.00 14 23.80 15 25.60 16 27.40 17 29.20 18 31.00 19 33.00 20 35.00 21 37.00 22 39.00 23 41.00 24 43.00 25 45.00 26 47.00 28 51.00 30 55.00 32 61.00 34 67.00 36 74.00 38 82.00 40 91.00	35 3 9.85 4 11.15 5 12.45 6 13.85 7 15.25 8 16.80 9 18.35 10 20.90 11 21.70 12 23.50 13 25.30 14 27.20 15 29.10 16 31.00 17 32.90 18 34.90 19 37.00 20 39.20 21 41.50 22 43.80 23 46.10 24 48.70 25 51.30 26 53.90 28 59.10 30 64.80 32 71.80 34 79.00 36 86.90 38 95.50 40 105.00	36 17 34.00 18 36.00 19 38.00 20 40.00 21 43.00 22 45.00 23 47.00 24 50.00 25 53.00 26 56.00 28 61.00 30 67.00 32 75.00 34 83.00 36 91.00 38 100.00 40 110.00	38 4 12.80 5 14.40 6 1.00 7 1.70 8 1.950 9 2.250 10 23.00 11 24.50 12 26.00 13 28.00 14 30.00 15 32.00 16 34.00 17 36.00 18 38.00 19 41.00 20 43.00 21 46.00 22 48.00 23 51.00 24 54.00 25 57.00 26 60.00 28 67.00 30 74.00 32 82.00 34 91.00 36 99.00 38 109.00 40 119.00
22 3 5.00 4 5.60 5 6.30 6 7.00 7 7.70 8 8.40 9 9.20 10 10.00 11 10.80 12 11.70 13 12.60 14 13.50 15 14.50 16 15.50 17 16.60 18 17.70 19 18.80 20 20.00 21 21.20 22 22.40 23 23.60 24 24.80 25 26.00 26 27.20 28 29.70 30 32.50	25 3 5.90 4 6.60 5 7.30 6 8.10 7 9.00 8 10.00 9 11.00 10 12.00 11 13.00 12 14.00 13 15.20 14 16.40 15 17.70 16 19.00 17 20.40 18 21.80 19 23.20 20 24.60 21 26.00 22 27.50 23 29.00 24 30.50 25 32.00 26 33.50 28 36.50 30 41.00 32 46.00 34 52.00 36 58.00 38 65.00 40 72.00	28 3 7.00 4 7.80 5 8.60 6 9.50 7 10.50 8 11.60 9 12.80 10 14.00 11 15.20 12 16.50 13 17.90 14 19.40 15 20.90 16 22.40 17 24.00 18 25.60 19 27.20 20 28.80 21 30.40 22 32.00 23 33.60 24 35.30 25 37.00 26 38.70	31 3 8.00 4 9.00 5 10.00 6 11.10 7 12.35 8 13.60 9 15.00 10 16.50 11 18.00 12 19.60	33 3 9.00 4 10.00 5 11.15 6 12.35 7 13.65 8 15.00 9 16.45 10 18.00 11 19.65 12 21.40 13 23.10 14 24.95 15 26.75 16 28.60 17 30.40 18 32.30 19 34.35 20 36.40 21 38.50 22 40.60 23 42.70 24 44.90 25 47.10 26 49.30 28 53.70 30 58.20 32 64.60 34 71.00	34 36 78.30 38 86.50 40 95.70	35 3 9.85 4 11.15 5 12.45 6 13.85 7 15.25 8 16.80 9 18.35 10 20.90 11 21.70 12 23.50 13 25.30 14 27.20 15 29.10 16 31.00 17 32.90 18 34.90 19 37.00 20 39.20 21 41.50 22 43.80 23 46.10 24 48.70 25 51.30 26 53.90 28 59.10 30 64.80 32 71.80 34 79.00 36 86.90 38 95.50 40 105.00	36 3 10.30 4 11.70 5 13.10 6 14.50 7 16.10 8 17.70 9 19.30 10 21.00 11 22.00 12 24.00 13 26.00 14 28.00 15 30.00 16 32.00
23 3 5.20 4 5.80 5 6.50 6 7.20 7 8.00 8 8.80 9 9.70 10 10.60 11 11.50 12 12.50 13 13.60 14 14.70 15 15.80 16 17.00 17 18.20	26 3 6.20 4 7.00 5 7.80 6 8.60 7 9.50 8 10.50	29 20 28.70 21 29.20 22 30.60 23 33.60 24 35.30 25 37.00 26 38.70	31 3 8.00 4 9.00 5 10.00 6 11.10 7 12.35 8 13.60 9 15.00 10 16.50 11 18.00 12 19.60	32 3 8.50 4 9.50 5 10.50 6 11.60 7 12.85 8 14.10 9 15.50 10 17.00 11 18.60 12 20.30 13 22.00 14 23.80 15 25.60 16 27.40 17 29.20 18 31.00 19 33.00 20 35.00 21 37.00 22 39.00 23 41.00 24 43.00 25 45.00 26 47.00 28 51.00 30 55.00 32 61.00 34 67.00 36 74.00 38 82.00 40 91.00	33 3 9.00 4 10.00 5 11.15 6 12.35 7 13.65 8 15.00 9 16.45 10 18.00 11 19.65 12 21.40 13 23.10 14 24.95 15 26.75 16 28.60 17 30.40 18 32.30 19 34.35 20 36.40 21 38.50 22 40.60 23 42.70 24 44.90 25 47.10 26 49.30 28 53.70 30 58.20 32 64.60 34 71.00	36 3 10.30 4 11.70 5 13.10 6 14.50 7 16.10 8 17.70 9 19.30 10 21.00 11 22.00 12 24.00 13 26.00 14 28.00 15 30.00 16 32.00	38 4 12.80 5 14.40 6 1.00 7 1.70 8 1.950 9 2.250 10 23.00 11 24.50 12 26.00 13 28.00 14 30.00 15 32.00 16 34.00 17 36.00 18 38.00 19 41.00 20 43.00 21 46.00 22 48.00 23 51.00 24 54.00 25 57.00 26 60.00 28 67.00 30 74.00 32 82.00 34 91.00 36 99.00 38 109.00 40 119.00



## WOOD SPLIT PULLEYS

PRICE LIST—Continued.

Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.	Diam. Face, In. In. Price.
42 4 15.00	46 16 45.00	50 32 128.00	56 11 46.00	60 28 136.00	66 10 57.00	70 26 157.00	
5 17.00	17 48.00	34 139.00	12 49.00	30 149.00	11 61.00	28 174.00	
6 19.00	18 51.00	36 151.00	13 52.00	32 163.00	12 64.00	30 191.00	
7 21.00	19 54.00	38 163.00	14 55.00	34 178.00	13 69.00	32 208.00	
8 23.00	20 57.00	40 174.00	15 59.00	36 193.00	14 73.00	34 226.00	
9 25.00	21 61.00	42 191.00	16 63.00	38 209.00	15 78.00	36 243.00	
10 27.00	22 65.00	44 207.00	17 66.00	40 225.00	16 83.00	38 261.00	
11 29.00	23 68.00	46 223.00	18 71.00	42 245.00	17 88.00	40 279.00	
12 31.00	24 73.00	48 240.00	19 75.00	44 265.00	18 93.00	42 302.00	
13 33.00	25 77.00		20 80.00	46 285.00	19 98.00	44 324.00	
14 35.00	26 82.00		21 85.00	48 305.00	20 103.00	46 347.00	
15 37.00	28 91.00	52 5 28.00	22 90.00		21 109.00	48 370.00	
16 39.00	30 101.00	6 32.00	23 95.00	62 6 44.00	22 115.00		
17 41.00	32 112.00	8 34.00	24 101.00	7 46.00	23 122.00		
18 44.00	34 123.00	9 36.00	25 106.00	8 48.00	24 129.00	72 6 54.00	
19 46.00	36 134.00	10 38.50	26 112.00	9 50.00	25 136.00	8 58.00	
20 49.00	38 145.00	11 41.00	28 124.00	10 52.00	26 143.00	9 62.00	
21 52.00	40 156.00	12 43.50	30 136.00	11 55.00	28 158.00	10 66.00	
22 55.00	42 170.00	13 46.00	32 149.00	12 58.00	30 173.00	11 70.00	
23 58.00	44 184.00	14 49.00	34 163.00	13 62.00	32 189.00	12 75.00	
24 62.00	46 199.00	15 52.00	36 176.00	14 66.00	34 206.00	13 80.00	
25 66.00	48 214.00	16 55.00	38 190.00	15 70.00	36 222.00	14 85.00	
26 70.00		17 58.00	40 204.00	16 75.00	38 240.00	15 90.00	
28 78.00		18 62.00	42 222.00	17 80.00	40 258.00	16 95.00	
30 87.00	48 4 21.00	19 66.00	44 240.00	18 85.00	42 278.00	17 100.00	
32 97.00	5 23.00	20 70.00	46 259.00	19 90.00	44 300.00	18 105.00	
34 107.00	6 25.00	21 75.00	48 279.00	20 95.00	46 322.00	19 111.00	
36 117.00	8 29.00	22 80.00		21 100.00	48 344.00	20 117.00	
38 127.00	9 31.50	23 85.00	58 6 38.00	22 106.00		21 123.00	
40 138.00	10 33.00	24 90.00	7 40.00	23 112.00	68 6 50.00	22 130.00	
42 150.00	11 36.20	25 95.00	8 42.00	24 118.00	7 52.00	23 138.00	
44 162.00	12 38.50	26 100.00	9 44.00	25 124.00	8 54.00	24 146.00	
46 175.00	13 40.00	28 112.00	10 46.00	27 130.00	9 56.00	25 155.00	
48 188.00	14 43.00	30 124.00	11 49.00	28 142.00	10 58.00	26 164.00	
	15 46.00	32 136.00	12 52.00	30 158.00	11 64.00	28 182.00	
44 4 17.00	16 48.00	34 148.00	13 55.00	32 176.00	12 68.00	30 200.00	
5 19.00	17 51.00	36 160.00	14 59.00	34 193.00	13 72.00	32 218.00	
6 21.00	18 54.00	38 172.00	15 62.00	36 202.00	14 77.00	34 236.00	
7 23.00	19 58.00	40 184.00	16 66.00	38 219.00	15 82.00	36 254.00	
8 25.00	20 61.00	42 200.00	17 71.00	40 238.00	16 87.00	38 272.00	
9 27.00	21 65.00	44 217.00	18 75.00	42 256.00	17 92.00	40 290.00	
10 29.00	22 70.00	46 235.00	19 80.00	44 276.00	18 97.00	42 312.00	
11 31.00	23 74.00	48 253.00	20 85.00	46 297.00	19 102.00	44 325.00	
12 33.00	24 78.00		21 90.00	48 318.00	20 108.00	46 349.00	
13 35.00	25 83.00	54 5 30.00	22 95.00		21 113.00	48 383.00	
14 37.00	26 88.00	6 32.00	23 101.00	64 6 46.00	22 120.00		
15 40.00	28 98.00	7 34.00	24 106.00	7 48.00	23 127.00	74 6 58.00	
16 42.00	30 109.00	8 36.00	25 112.00	8 50.00	24 134.00	7 60.00	
17 44.00	32 120.00	9 38.50	26 118.00	9 52.00	25 142.00	8 62.00	
18 47.00	34 131.00	10 41.20	28 130.00	10 55.00	26 150.00	9 66.00	
19 50.00	36 142.00	11 43.80	30 143.00	11 58.00	28 168.00	10 70.00	
20 53.00	38 154.00	12 46.00	32 156.00	12 61.00	30 182.00	11 75.00	
21 56.00	40 165.00	13 49.00	34 170.00	13 65.00	32 198.00	12 80.00	
22 59.00	42 180.00	14 52.00	36 185.00	14 69.00	34 216.00	13 85.00	
23 63.00	44 195.00	15 55.00	38 200.00	15 74.00	36 233.00	14 90.00	
24 67.00	46 211.00	16 59.00	40 215.00	16 79.00	38 250.00	15 95.00	
25 71.00	48 227.00	17 62.00	42 234.00	17 84.00	40 268.00	16 100.00	
26 76.00		18 66.00	44 253.00	18 89.00	42 290.00	17 105.00	
28 84.00		19 70.00	46 272.00	19 94.00	44 312.00	18 110.00	
30 94.00	50 5 25.00	20 75.00	48 292.00	20 99.00	46 334.00	19 116.00	
32 104.00	6 27.00	21 80.00		21 104.00	48 357.00	20 122.00	
34 115.00	7 29.00	22 85.00	60 6 41.00	22 110.00		21 128.00	
36 125.00	8 31.00	23 90.00	7 43.00	23 117.00	70 6 52.00	22 135.00	
38 136.00	9 33.70	24 95.00	8 45.00	24 123.00	7 54.00	23 143.00	
40 147.00	10 36.20	25 100.00	9 47.00	25 130.00	8 56.00	24 152.00	
42 161.00	11 38.60	26 106.00	10 49.00	26 136.00	9 59.00	25 161.00	
44 174.00	12 41.00	28 118.00	11 52.00	28 150.00	10 63.00	26 170.00	
46 187.00	13 43.00	30 130.00	12 55.00	30 164.00	11 67.00	28 188.00	
48 201.00	14 45.00	32 142.00	13 58.00	32 179.00	12 71.00	30 207.00	
	15 49.00	34 155.00	14 62.00	34 196.00	13 76.00	32 225.00	
	16 51.00	36 168.00	15 66.00	36 212.00	14 81.00	34 244.00	
46 4 19.00	17 54.00	38 181.00	16 71.00	38 229.00	15 86.00	36 263.00	
5 21.00	18 58.00	40 194.00	17 75.00	40 246.00	16 91.00	38 282.00	
6 23.00	19 62.00	42 211.00	18 80.00	42 267.00	17 96.00	40 301.00	
7 25.00	20 65.00	44 228.00	19 85.00	44 288.00	18 101.00	42 324.00	
8 27.00	21 70.00	46 247.00	20 90.00	46 309.00	19 106.00	44 348.00	
9 29.00	22 75.00	48 266.00	21 95.00	48 331.00	20 112.00	46 372.00	
10 31.00	24 84.00	56 6 35.00	22 100.00		21 118.00	48 396.00	
11 33.00	26 89.00	7 37.00	23 106.00	66 6 48.00	22 125.00		
12 36.00	25 89.00	8 39.00	24 112.00	7 50.00	23 132.00	76 6 62.00	
13 38.00	26 94.00	9 41.00	25 118.00	8 52.00	24 140.00	7 64.00	
14 40.00	28 105.00	10 43.00	26 124.00	9 54.00	25 148.00	8 66.00	
16 43.00	30 116.00						



## WOOD SPLIT PULLEYS

PRICE LIST—Continued.

Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.
76 9 71.00	80 32 249.00	86 18 153.00	92 8 105.00	96 30 326.00	102 17 222.00	108 8 145.00
10 75.00	34 270.00	19 160.00	9 112.00	32 348.00	18 233.00	9 155.00
11 80.00	36 291.00	20 167.00	10 120.00	34 371.00	19 244.00	10 165.00
12 85.00	38 312.00	21 174.00	11 127.00	36 394.00	20 255.00	11 175.00
13 90.00	40 334.00	22 182.00	12 135.00	38 416.00	21 266.00	12 186.00
14 95.00	42 359.00	23 191.00	13 142.00	40 439.00	22 277.00	13 196.00
15 100.00	44 384.00	24 200.00	14 150.00	42 470.00	23 288.00	14 207.00
16 105.00	46 409.00	25 210.00	15 157.00	44 498.00	24 299.00	15 218.00
17 110.00	48 435.00	26 220.00	16 166.00	46 526.00	25 310.00	16 229.00
18 116.00		28 240.00	17 174.00	48 555.00	26 321.00	17 241.00
19 122.00		30 261.00	18 183.00		28 343.00	18 253.00
20 128.00	82 8 80.00	32 283.00	19 191.00	98 8 120.00	30 365.00	19 265.00
21 134.00	10 90.00	34 305.00	20 200.00	9 129.00	32 388.00	20 277.00
22 141.00	11 95.00	36 327.00	21 209.00	10 138.00	34 411.00	21 289.00
23 149.00	12 100.00	38 349.00	22 218.00	11 147.00	36 434.00	22 301.00
24 158.00	13 105.00	40 372.00	23 227.00	12 156.00	38 457.00	23 314.00
25 167.00	14 110.00	42 399.00	24 237.00	13 165.00	40 480.00	24 326.00
26 176.00	15 115.00	44 426.00	25 247.00	14 174.00	42 510.00	25 338.00
28 195.00	16 121.00	46 453.00	26 258.00	15 183.00	44 540.00	26 350.00
30 214.00	17 127.00	48 480.00	28 279.00	16 193.00	46 570.00	28 375.00
32 233.00	18 133.00		30 300.00	17 203.00	48 600.00	30 399.00
34 253.00	19 139.00	88 8 95.00	32 322.00	18 213.00		32 424.00
36 272.00	20 145.00	9 101.00	34 345.00	19 223.00	104 8 135.00	84 440.00
38 292.00	21 152.00	10 108.00	36 367.00	20 233.00	9 145.00	36 474.00
40 312.00	22 159.00	11 114.00	38 390.00	21 243.00	10 155.00	38 508.00
42 336.00	23 167.00	12 121.00	40 412.00	22 253.00	11 165.00	40 525.00
44 360.00	24 176.00	13 127.00	42 441.00	23 263.00	12 175.00	42 555.00
46 384.00	25 185.00	14 134.00	44 469.00	24 274.00	13 185.00	44 585.00
48 409.00	26 195.00	15 140.00	46 497.00	25 285.00	14 195.00	46 615.00
	28 215.00	16 148.00	48 525.00	26 295.00	15 206.00	48 645.00
	30 235.00	17 155.00		28 317.00	16 217.00	
78 8 71.00	32 257.00	18 163.00	94 8 110.00	30 339.00	17 228.00	
9 75.00	34 279.00	19 170.00	9 118.00	32 361.00	18 239.00	110 8 150.00
10 80.00	36 301.00	20 178.00	10 126.00	34 384.00	19 251.00	9 160.00
11 85.00	38 323.00	21 186.00	11 134.00	36 407.00	20 262.00	10 170.00
12 90.00	40 345.00	22 194.00	12 142.00	38 430.00	21 273.00	11 180.00
13 95.00	42 372.00	23 203.00	13 150.00	40 453.00	22 285.00	12 191.00
14 100.00	44 398.00	24 212.00	14 158.00	42 485.00	23 296.00	13 202.00
15 105.00	46 424.00	25 222.00	15 166.00	44 512.00	24 308.00	14 213.00
16 110.00	48 450.00	26 232.00	16 175.00	46 541.00	25 319.00	15 224.00
17 116.00		28 253.00	17 184.00	48 570.00	26 330.00	16 235.00
18 121.00		30 274.00	18 193.00		28 353.00	17 247.00
19 127.00	84 8 85.00	32 296.00	19 202.00	100 8 125.00	30 376.00	18 259.00
20 133.00	9 90.00	34 318.00	20 211.00	9 134.00	32 400.00	19 272.00
21 140.00	10 96.00	36 340.00	21 220.00	10 144.00	34 423.00	20 285.00
22 147.00	11 101.00	38 363.00	22 229.00	11 153.00	36 447.00	21 297.00
23 155.00	12 107.00	40 385.00	23 239.00	12 163.00	38 471.00	22 310.00
24 164.00	13 112.00	42 412.00	24 249.00	13 172.00	40 495.00	23 322.00
25 173.00	14 118.00	44 439.00	25 260.00	14 182.00	42 525.00	24 335.00
26 182.00	15 123.00	46 467.00	26 270.00	15 191.00	44 555.00	25 348.00
28 201.00	16 130.00	48 495.00	28 291.00	16 202.00	46 585.00	26 360.00
30 221.00	17 136.00		30 313.00	17 212.00	48 615.00	28 385.00
32 241.00	18 143.00	90 8 100.00	32 335.00	18 223.00		30 411.00
34 261.00	19 149.00	9 107.00	34 358.00	19 233.00	106 8 140.00	32 436.00
36 282.00	20 156.00	10 114.00	36 380.00	20 244.00	9 150.00	34 462.00
38 302.00	21 163.00	11 121.00	38 403.00	21 254.00	10 160.00	36 488.00
40 323.00	22 170.00	12 128.00	40 426.00	22 265.00	11 170.00	38 514.00
42 347.00	23 179.00	13 135.00	42 455.00	23 275.00	12 180.00	40 540.00
44 372.00	24 188.00	14 142.00	44 483.00	24 286.00	13 191.00	42 570.00
46 397.00	25 197.00	15 149.00	46 511.00	25 297.00	14 201.00	44 600.00
48 422.00	26 207.00	16 157.00	48 540.00	26 308.00	15 212.00	46 630.00
	28 227.00	17 165.00		28 330.00	16 223.00	48 660.00
80 8 75.00	30 248.00	18 173.00	96 8 115.00	30 352.00	17 234.00	
9 80.00	32 270.00	19 181.00	9 125.00	32 374.00	18 246.00	112 8 155.00
10 85.00	34 292.00	20 189.00	10 132.00	34 397.00	19 258.00	9 165.00
11 90.00	36 314.00	21 197.00	11 140.00	36 420.00	20 270.00	10 175.00
12 95.00	38 336.00	22 206.00	12 149.00	38 443.00	21 281.00	11 186.00
13 100.00	40 358.00	23 215.00	13 157.00	40 466.00	22 293.00	12 197.00
14 105.00	42 385.00	24 225.00	14 166.00	42 495.00	23 305.00	13 208.00
15 110.00	44 411.00	25 235.00	15 174.00	44 525.00	24 317.00	14 219.00
16 115.00	46 438.00	26 245.00	16 184.00	46 555.00	25 329.00	15 230.00
17 121.00	48 465.00	28 266.00	17 193.00	48 585.00	26 340.00	16 242.00
18 127.00		30 287.00	18 203.00		28 364.00	17 254.00
19 133.00	86 8 90.00	32 309.00	19 212.00	102 8 130.00	30 388.00	18 266.00
20 139.00	9 96.00	34 331.00	20 222.00	9 140.00	32 412.00	19 278.00
21 146.00	10 102.00	36 354.00	21 231.00	10 150.00	34 436.00	20 292.00
22 153.00	11 108.00	38 376.00	22 241.00	11 160.00	36 461.00	21 305.00
23 161.00	12 114.00	40 399.00	23 251.00	12 170.00	38 485.00	22 318.00
24 170.00	13 120.00	42 426.00	24 262.00	13 180.00	40 510.00	23 331.00
25 179.00	14 126.00	44 454.00	25 272.00	14 190.00	42 540.00	24 344.00
26 188.00	15 132.00	46 482.00	26 283.00	15 200.00	44 570.00	25 357.00
28 208.00	16 139.00	48 510.00	28 304.00	16 211.00	46 600.00	26 370.00
30 228.00	17 146.00				48 630.00	28 396.00

## WOOD SPLIT PULLEYS

**PRICE LIST—Continued.**

Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.	Diam. Face. In. In. Price.
112 30 422.00	116 20 307.00	120 12 218.00	124 22 368.00	128 46 756.00	134 32 571.00	140 20 402.00
32 449.00	21 321.00	13 230.00	24 398.00	48 789.00	34 606.00	22 436.00
34 475.00	23 335.00	14 242.00	26 420.00		36 630.00	24 460.00
36 502.00	23 348.00	15 254.00	28 450.00		38 672.00	26 501.00
38 528.00	24 362.00	16 266.00	30 490.00		40 703.00	28 535.00
40 555.00	25 376.00	17 276.00	32 520.00		42 734.00	30 570.00
42 585.00	26 390.00	18 293.00	34 551.00		44 765.00	32 604.00
44 615.00	28 417.00	19 307.00	36 581.00		46 796.00	34 639.00
46 645.00	30 445.00	20 322.00	38 612.00		48 831.00	36 673.00
48 675.00	32 473.00	21 337.00	40 642.00		22 392.00	38 708.00
	34 501.00	22 351.00	42 672.00		24 422.00	40 742.00
114 8 160.00	36 529.00	23 366.00	44 702.00		26 456.00	42 776.00
9 170.00	38 557.00	24 380.00	46 732.00		28 486.00	44 810.00
10 180.00	40 585.00	25 395.00	48 763.00		30 520.00	46 844.00
11 191.00	42 615.00	26 410.00			32 550.00	48 879.00
12 202.00	44 645.00	28 439.00	126 10 210.00		34 584.00	
13 213.00	46 675.00	30 468.00	12 234.00		36 614.00	
14 224.00	48 705.00	32 497.00	14 260.00		38 648.00	
15 236.00		34 527.00	16 287.00		40 678.00	
16 248.00	118 8 170.00	36 556.00	18 316.00		42 708.00	
17 260.00	9 180.00	38 585.00	20 346.00		44 738.00	
18 273.00	10 190.00	40 615.00	22 376.00		46 768.00	
19 286.00	11 201.00	42 645.00	24 406.00		48 802.00	
20 300.00	12 213.00	44 675.00	26 438.00	132 12 249.00		
21 313.00	13 224.00	46 705.00	28 468.00	14 278.00		
22 326.00	14 236.00	48 735.00	30 500.00	16 308.00		
23 340.00	15 248.00		32 530.00	18 340.00		
24 353.00	16 260.00	122 10 200.00	34 562.00	20 370.00		
25 367.00	17 273.00	12 224.00	36 592.00	22 400.00		
26 380.00	18 286.00	14 248.00	38 624.00	24 430.00		
28 407.00	19 300.00	16 273.00	40 654.00	26 465.00		
30 434.00	20 315.00	18 300.00	42 684.00	28 495.00		
32 461.00	21 329.00	20 330.00	44 714.00	30 530.00		
34 488.00	22 343.00	22 360.00	46 744.00	32 560.00		
36 515.00	23 357.00	24 390.00	48 776.00	34 595.00		
38 542.00	24 371.00	26 420.00		36 625.00		
40 570.00	25 386.00	28 450.00	128 10 215.00	38 660.00		
42 600.00	26 400.00	30 480.00	12 239.00	40 690.00		
44 630.00	27 428.00	32 510.00	14 266.00	42 720.00		
46 660.00	30 457.00	34 540.00	16 294.00	44 750.00		
48 690.00	32 485.00	36 570.00	18 324.00	46 780.00		
	34 514.00	38 600.00	20 354.00	48 815.00		
116 8 165.00	36 542.00	40 630.00	22 384.00			
9 175.00	38 571.00	42 660.00	24 414.00			
10 185.00	40 600.00	44 690.00	26 447.00	134 12 255.00		
11 196.00	42 630.00	46 720.00	28 477.00	14 284.00		
12 207.00	44 660.00	48 750.00	30 510.00	16 315.00		
13 219.00	46 690.00		32 540.00	18 347.00		
14 230.00	48 720.00	124 10 205.00	34 573.00	20 378.00		
15 242.00		12 229.00	36 603.00	22 409.00		
16 254.00	120 8 175.00	14 254.00	38 636.00	24 439.00		
17 266.00	9 185.00	16 280.00	40 666.00	26 474.00		
18 279.00	10 195.00	18 308.00	42 696.00	28 505.00		
19 293.00	11 206.00	20 338.00	44 726.00	30 540.00		

### PRICE LIST FOR EXTRA WOOD BUSHINGS.

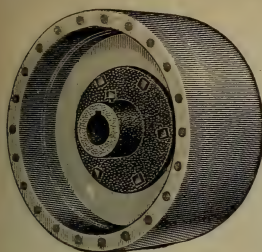
Length in Inches.	Outside Diameter in Inches.				
	2 and $2\frac{1}{8}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$
6	.30	.30	.30	.36	.42
8	.40	.40	.40	.48	.56
10	.50	.50	.50	.60	.70
12	.60	.60	.60	.72	.84
14	.70	.70	.70	.84	.98
16	.80	.80	.80	.96	1.12
18	.90	.90	.90	1.08	1.26
20	1.00	1.00	1.00	1.20	1.40

Subject to same discount as pulleys. Net prices will be quoted on application for bushings of larger dimensions.

### PRICE LIST OF IRON SLEEVES.

### For Tight and Loose Pulleys.

Face of Pulley in Inches.	Bore.	Price.	Face of Pulley in Inches.	Bore.	Price.
3	1 1/4	1.85	5	1 1/4	3.20
3	1 1/2	2.00	5	1 1/2	3.50
3	1 3/4	2.20	6	1 1/4	3.00
3	1 5/8	2.35	6	1 1/2	3.35
4	1 1/4	2.20	6	1 3/4	3.70
4	1 1/2	2.35	6	2 1/4	4.15
4	1 3/4	2.50	8	1 1/2	3.85
4	1 5/8	2.70	8	1 3/4	4.15
5	1 1/4	2.50	8	1 5/8	4.70
5	1 1/2	2.70	8	2 1/4	5.35
5	1 3/4	2.85			



## ROCKWOOD'S PATENT PAPER PULLEYS.

NON-SLIPPING, NON-BREAK-  
ABLE, HIGH EFFICIENCY, FOR  
SEVERE AND HIGH-CLASS  
SERVICE.

### ABRIDGED PRICE LIST.

Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.
2	2	\$2 00		6	7	\$3 70		9	9	\$4 90		11	17		\$13 75	14	18		\$17 75
3	3	2 05		8	8	4 00		10	10	5 30		12	18		14 95	16	19		19 50
4	4	2 10		9	9	4 40		11	11	5 80		13	20			18	20		21 00
5	5	2 20		10	10	4 80		12	12	6 40		14	21			19	21		22 60
6	6	2 35		11	11	5 30		13	13	7 00		15	4	4 45		20	22		
3	3	2 10		7	3	3 20		10	3	3 75		12	3	\$4 25		16	3	5 30	
3	3	2 15		4	4	3 25		4	4	3 80		6	5	4 70		4	5 70		
4	4	2 20		5	5	3 40		5	5	3 95		7	5	5 40		5	6 10		
5	5	2 30		6	6	3 55		6	6	4 15		8	5	5 80		6	6 60		
6	6	2 45		7	7	3 80		7	7	4 40		9	6	6 30	7 55	7	7 20		
7	7	2 65		8	8	4 15		8	8	4 70		10	6	6 90	8 30	8	7 80		
4	2	2 20		9	4	5 50		9	5	5 05	\$6 05	11	7	7 50	9 00	9	8 50		
3	3	2 25		10	4	4 95		10	5	5 50	6 60	12	8	8 20	9 85	10	9 25	11 10	
4	4	2 30		11	5	4 45		11	6	6 00	7 20	13			10 75	11	10 05	12 05	
5	5	2 40		12	6	6 00		12	6	6 55	7 85	14			11 70	12	10 95	13 15	
6	6	2 55		8	3	3 40		13			8 65	15			12 75	13	11 90	14 25	
7	7	2 75		4	4	3 45		14			9 45	16			13 85	14	12 90	15 50	
8	8	3 00		5	5	3 55		15			10 35	17			15 10	15		16 75	
5	2	2 30		6	3	3 75		16			11 35	18			17 20	16		18 05	
3	3	2 35		7	4	4 00		11	3	4 00		14	3	4 75		17		19 50	
4	4	2 40		8	4	4 30		4	4	4 15		5	4	5 00		18		21 00	
5	5	2 50		9	5	4 70		5	5	4 30		6	5	5 30		19		22 60	
6	6	2 65		10	5	5 10		6	6	4 55		7	6	6 10		20		24 20	
7	7	2 85		11	5	5 60		7	7	4 90		8	6	6 60		21		25 95	
8	8	3 10		12	6	6 20		8	5	5 25		9	7	7 20		22		27 75	
9	9	3 40		13	6	6 80		9	5	5 70	6 85	10	7	7 80	9 35	23		29 65	
10	3	3 75		9	3	3 55		10	6	6 20	7 45	11	8	8 50	10 20	24		31 60	
6	3	3 05		4	3	3 65		11	6	6 75	8 10	12	9	9 25	11 10	18	3	5 95	
4	4	3 15		5	3	3 75		12	7	7 40	8 90	13	10	10 05	12 10	4	6 45		
5	5	3 25		6	3	3 95		13			9 70	14			13 15	5	7 00		
6	6	3 45		7	4	4 20		14			10 55	15			14 25	6	7 60		
				8	4	4 50		15			11 55	16			15 50	7	8 30		
								16			12 60	17			16 75	8	9 05		
																9	9 90		



## ROCKWOOD'S PATENT PAPER PULLEYS.

## PRICE LIST—CONTINUED.

Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.	Diam.	Face.	Double Belt.	Double Web.
18	10	\$10 75	.....	22	9	\$12 40	.....	26	4	\$9 75	.....	30	29	.....	\$67 30	32	29	.....	\$53 85
	11	11 70	\$14 05		10	13 45	.....		5	10 70	.....		30	.....	70 45		23	.....	56 70
	12	12 70	15 25		11	14 55	.....		6	11 70	.....		31	.....	73 65		24	.....	59 65
	13	13 75	16 50		12	15 75	\$18 90		7	12 45	.....		32	.....	76 90		25	.....	62 65
	14	14 90	17 90		13	17 00	20 40		8	13 90	.....		33	.....	80 20		26	.....	65 70
	15	.....	19 30		14	18 30	21 95		9	15 05	.....				.....		27	.....	68 85
	16	.....	20 75		15	19 70	23 65		10	16 30	.....		30	5	\$12 80	.....	28	.....	72 10
	17	.....	22 35		16	21 10	25 30		11	17 60	.....		6	14 00	.....		29	.....	75 40
	18	.....	24 00		17	.....	27 15		12	19 00	\$22 80		7	15 25	.....		30	.....	78 75
	19	.....	25 75		18	.....	29 00		13	20 45	24 55		8	16 55	.....		31	.....	82 15
	20	.....	27 55		19	.....	31 05		14	21 95	26 35		9	17 95	.....		32	.....	85 60
	21	.....	29 40		20	.....	33 00		15	23 50	28 20		10	19 40	.....		33	.....	89 10
	22	.....	31 25		21	.....	35 10		16	25 10	30 10		11	20 90	.....				
	23	.....	33 40		22	.....	37 30		17	26 80	32 20		12	22 45	.....	34	5	\$15 20	.....
	24	.....	35 50		23	.....	39 55		18	.....	34 30		13	24 05	28 90		6	16 55	.....
	25	.....	37 65		24	.....	41 85		19	.....	36 45		14	25 75	30 90		7	18 00	.....
	26	.....	39 90		25	.....	44 25		20	.....	38 70		15	27 50	33 00		8	19 50	.....
	27	.....	42 25		26	.....	46 75		21	.....	41 05		16	29 30	35 15		9	21 05	.....
					27	.....	49 30		22	.....	43 42		17	31 15	37 35		10	22 70	.....
20	4	7 15	.....		28	.....	51 90		23	.....	45 90		18	33 15	39 75		11	24 40	.....
	5	7 75	.....		29	.....	54 60		24	.....	48 45		19	35 15	42 15		12	26 10	.....
	6	8 45	.....		30	.....	57 40		25	.....	51 10		20	.....	44 65		13	27 95	.....
	7	9 20	.....		31	.....	60 20		26	.....	53 80		21	.....	47 20		14	29 80	35 75
	8	10 00	.....						27	.....	56 55		22	.....	49 80		15	31 75	38 10
	9	10 90	.....						28	.....	59 40		23	.....	52 50		16	33 75	40 50
	10	11 85	.....	24	4	8 80	.....		29	.....	62 35		24	.....	55 30		17	35 80	43 00
	11	12 80	15 35		5	9 60	.....		30	.....	65 35		25	.....	58 15		18	37 95	45 55
	12	13 90	16 70		6	10 50	.....		31	.....	68 40		26	.....	61 05		19	40 15	48 15
	13	15 00	18 00		7	11 45	.....	28	5	11 80	.....		27	.....	64 05		20	42 40	50 85
	14	16 20	19 45		8	12 45	.....		6	12 95	.....		28	.....	67 15		21	.....	53 65
	15	17 45	20 95		9	13 50	.....		7	14 10	.....		29	.....	70 30		22	.....	56 50
	16	.....	22 50		10	14 60	.....		8	15 40	.....		30	.....	73 50		23	.....	59 40
	17	.....	24 15		11	15 80	.....		9	16 70	.....		31	.....	76 75		24	.....	62 40
	18	.....	25 90		12	17 05	20 45		10	18 05	.....		32	.....	80 05		25	.....	65 50
	19	.....	27 70		13	18 40	22 05		11	19 50	.....		33	.....	83 40		26	.....	68 65
	20	.....	29 55		14	19 75	23 70		12	21 00	.....				.....		27	.....	71 85
	21	.....	31 50		15	21 20	25 45		13	22 55	27 10		32	5	14 05	.....	28	.....	75 15
	22	.....	33 55		16	22 70	27 25		14	24 20	29 05		6	15 40	.....		29	.....	78 55
	23	.....	35 65		17	24 25	29 10		15	25 90	31 05		7	16 75	.....		30	.....	82 00
	24	.....	37 80		18	.....	31 05		16	27 60	33 10		8	18 20	.....		31	.....	85 50
	25	.....	40 05		19	.....	33 10		17	29 45	35 35		9	19 70	.....		32	.....	89 05
	26	.....	42 40		20	.....	35 20		18	31 30	37 60		10	21 25	.....		33	.....	92 65
	27	.....	44 80		21	.....	37 35		19	.....	39 90		11	22 90	.....				
	28	.....	47 25		22	.....	39 60		20	.....	42 30		12	24 55	.....	36	5	16 50	.....
	29	.....	49 80		23	.....	41 95		21	.....	44 80		13	26 30	.....		6	18 00	.....
	30	.....	52 45		24	.....	44 30		22	.....	47 30		14	28 10	33 70		7	19 55	.....
	31	.....	55 10		25	.....	46 80		23	.....	49 95		15	30 00	36 00		8	21 20	.....
					26	.....	49 35		24	.....	52 65		16	31 95	38 35		9	22 90	.....
22	4	8 00	.....		27	.....	52 00		25	.....	55 45		17	33 95	40 75		10	24 60	.....
	5	8 75	.....		28	.....	54 70		26	.....	58 30		18	36 00	43 20		11	26 45	.....
	6	9 55	.....		29	.....	57 45		27	.....	61 20		19	38 15	45 75		12	28 20	.....
	7	10 45	.....		30	.....	60 30		28	.....	64 20		20	40 30	48 40		13	30 25	.....
	8	11 40	.....		31	.....	63 20						21	.....	51 10		14	32 25	.....

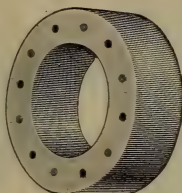
SEND FOR COMPLETE LIST (LARGER SIZES).



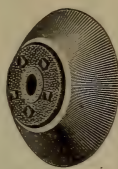
# ROCKWOOD'S PATENT PAPER FRICTIONS AND FILLERS.



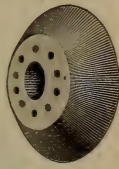
Spur Friction.  
(With Flanges.)



Spur Filler.



Bevel Friction.  
(With Flanges.)



Bevel Filler.

## PRICE LIST.

Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.
4	3	\$ 88	\$2 12	7	4	\$1 80	\$4 00	10	6	\$1 90	\$8 60	13	5	\$6 40	\$11 08
	4	1 12	2 60		5	2 22	4 62		7	5 62	9 58		6	7 48	12 50
	5	1 36	3 02		6	2 64	5 28		8	6 34	10 58		7	8 58	14 00
	6	1 60	3 42		7	3 06	5 90		9	7 06	11 66		8	9 66	15 30
	7	1 84	3 84		8	3 48	6 58		10	7 78	12 64		9	10 74	16 78
	8	2 08	4 26		9	3 90	4 54		12	9 22	14 62		10	11 84	18 20
	9	2 32	4 68		10	4 32	5 16		14	10 66	16 60		12	14 00	21 00
	10	2 56	5 10										14	16 18	23 80
5	3	96	2 38	8	3	1 62	3 82	11	4	3 96	7 44				
	4	1 22	2 84		4	2 14	4 58		5	4 80	8 56	14	4	5 96	10 74
	5	1 50	3 30		5	2 64	5 28		6	5 64	9 66		5	7 19	12 27
	6	1 78	3 76		6	3 16	6 04		7	6 48	10 78		6	8 44	13 84
	7	2 04	4 20		7	3 66	6 76		8	7 32	11 88		7	9 68	15 38
	8	2 32	4 66		8	4 18	7 52		9	8 16	13 08		8	10 92	16 96
	9	2 58	5 02		9	4 68	8 28		10	9 00	14 20		9	12 16	18 58
	10	2 86	5 48		10	5 22	9 10		12	10 68	16 42		10	13 40	20 16
									14	12 36	18 64		12	15 88	23 26
6	3	1 14	2 80	9	3	2 10	4 68	12	4	4 46	8 28		14	18 38	26 38
	4	1 48	3 28		4	2 70	5 40		5	5 42	9 50				
	5	1 80	3 78		5	3 30	6 22		6	6 38	10 72	15	4	6 32	11 10
	6	2 14	4 30		6	3 90	7 06		7	7 34	11 96		5	7 68	12 76
	7	2 46	4 80		7	4 50	7 86		8	8 30	13 20		6	9 02	14 42
	8	2 80	5 32		8	5 10	8 70		9	9 26	14 52		7	10 38	16 08
	9	3 12	5 82		9	5 70	9 54		10	10 22	15 74		8	11 74	17 78
	10	3 46	6 30		10	6 30	10 36		12	12 14	18 20		9	13 08	19 50
									14	14 08	20 68		10	14 44	21 20
7	3	1 38	3 38	10	4	3 46	6 62	13	4	5 32	9 70		12	17 14	24 52
					5	4 18	7 60						14	19 48	27 90

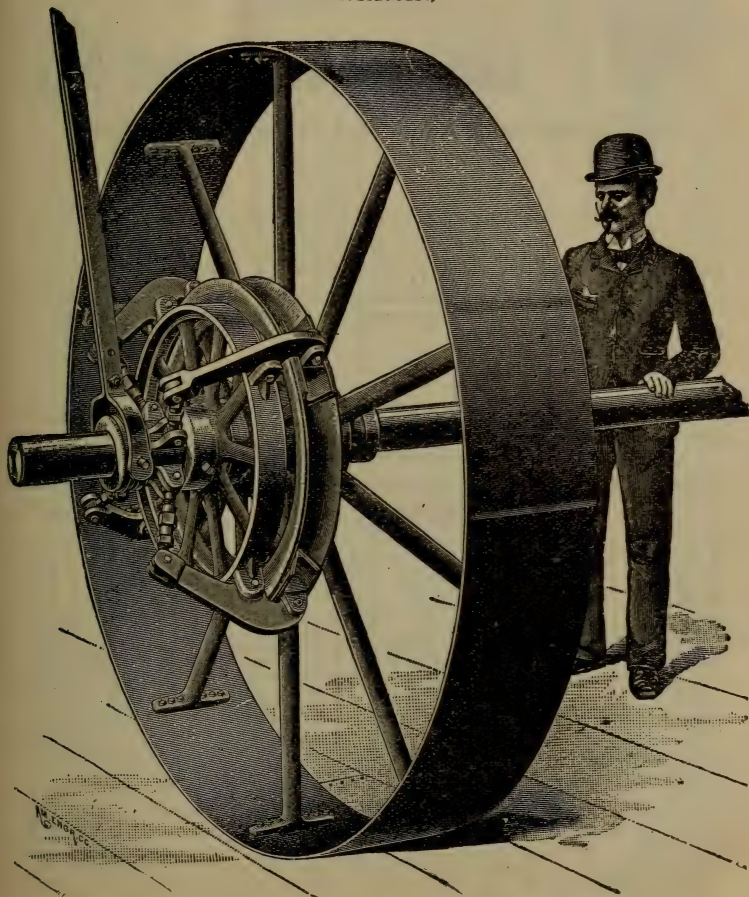
## FRICTION AND FILLER LIST.

PRICE LIST—CONTINUED.

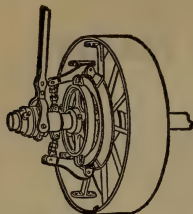
Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.	Diameter.	Face.	Pressed Friction Roll or Filler.	Friction with Flanges.
16	4	\$6 87	\$12 77	22	14	\$34 18	\$51 34	32	10	\$45 78	\$72 40	42	10	\$74 40	\$130 44				
	5	8 34	14 58		16	38 90	56 88		12	54 68	81 96		12	89 02	152 72				
	6	9 82	16 42						14	63 62	91 56		14	103 64	161 00				
	7	11 28	18 24	24	5	14 70	30 58		16	72 52	101 12		16	118 24	176 26				
	8	12 74	20 06		6	17 44	33 64						18	132 86	191 54				
	9	14 22	22 02		7	20 16	36 70	34	5	26 08	57 61		20	147 48	206 82				
	10	15 68	23 84		8	22 88	39 74		6	31 06	62 94								
	12	18 62	27 50		9	25 60	43 00		7	36 02	68 21	44	7	57 12	121 98				
	14	21 54	31 44		10	28 32	46 04		8	40 98	73 50		8	65 08	130 28				
17	4	7 42	13 82		12	33 76	52 14		9	45 96	78 82		9	73 06	138 58				
	5	9 02	15 78		14	39 20	58 24		10	50 94	84 12		10	81 02	146 88				
	6	10 62	17 74		16	44 64	64 14		12	60 88	94 72		12	96 96	163 48				
	7	12 22	19 70						14	70 82	105 32		14	112 88	180 06				
	8	13 82	21 66	26	5	15 72	33 72		16	80 76	115 92		16	128 84	196 68				
	9	15 42	23 74		6	18 64	36 98						18	144 78	213 28				
	10	17 02	25 70		7	21 56	40 16	36	6	34 28	70 02		20	160 70	229 86				
	12	20 20	29 60		8	24 48	43 48		7	39 80	77 66								
	14	23 40	33 30		9	27 40	46 94		8	45 32	83 52	46	8	70 66	141 14				
18	5	9 72	16 98		10	30 32	50 18		9	50 82	89 34		9	79 32	150 12				
	6	11 46	19 08		12	36 16	56 68		10	56 32	95 18		10	87 98	159 12				
	7	13 20	21 18		14	41 98	63 16		12	67 34	106 86		12	105 30	177 10				
	8	14 92	23 26		16	47 84	69 68		14	78 36	118 54		14	122 62	195 08				
	9	16 66	25 48	28	5	18 80	39 12		16	89 38	130 22		16	139 94	213 06				
	10	18 40	27 58		6	22 34	42 98		18	100 38	141 88		18	157 26	231 04				
	12	21 88	31 78		7	25 86	46 84	38	6	37 74	79 86		20	174 58	249 02				
	14	25 36	35 98		8	29 40	50 70		7	43 82	86 27		22	191 92	267 02				
	16	28 82	40 16		9	32 94	54 78		8	49 88	92 66								
20	5	11 22	21 36		10	36 46	58 64		9	59 98	103 09	48	8	76 44	153 12				
	6	13 26	23 76		12	43 52	66 36		10	62 06	105 50		9	85 82	162 84				
	7	15 30	26 16		14	50 58	74 08		12	74 20	118 30		10	95 20	169 54				
	8	17 32	28 54		16	57 64	81 78		14	86 36	131 12		12	113 96	191 96				
	9	19 36	31 06	30	5	21 06	42 50		16	98 52	143 94		14	132 72	211 38				
	10	21 40	33 46		6	25 04	46 82		18	110 68	156 76		16	151 48	230 80				
	12	25 46	38 24		7	29 02	51 12	40	7	48 04	94 72		18	170 25	250 24				
	14	29 54	43 04		8	33 00	55 44		8	54 72	101 73		20	189 02	269 06				
	16	33 60	47 82		9	36 98	59 96		9	61 38	108 72		22	207 78	289 08				
22	5	12 90	26 60		10	40 96	61 26		10	68 08	115 75	50	8	82 44	164 88				
	6	15 26	29 34		12	48 92	73 88		12	81 43	129 76		9	92 56	175 34				
	7	17 62	32 06		14	56 76	81 38		14	94 78	143 78		10	102 68	185 78				
	8	19 98	34 78	32	16	64 82	90 10		16	108 14	157 80		12	122 96	206 72				
	9	22 36	37 66		5	23 48	48 44		18	121 50	171 82		14	143 20	227 62				
	10	24 72	40 44		6	27 94	53 24	42	7	52 48	107 54		16	163 46	248 54				
	12	29 44	45 88		7	32 40	58 02		8	59 78	115 10		18	183 72	269 46				
					8	36 86	62 82		9	67 08	122 80		20	203 98	290 38				
					9	41 32	67 60						22	224 24	311 30				
													24	244 48	332 20				

## FOUR-ARM FRICTION CLUTCH PULLEY.

(PATENTED.)



OUT NO. 1.



## FRICION CLUTCH PULLEYS

—FOR—

### Single and Double Belt Duty.

Prices on Clutches for Heavier Duty Furnished on Application.

See page 17 for Cipher Code, for Bores, Single and Double Belt, etc.

For Double Friction Clutches, use prices of the two Clutch Pulleys composing it.

List prices are based on the following size bores:

2	7/16	inches on pulleys,	10 to 24	inches diameter, inclusive.	} A reduction in price will be made on smaller bores and an extra charge made for larger bores.
2	15/16	"	25 to 35	"	
3	7/16	"	36 to 46	"	
3	15/16	"	48 to 58	"	
4	15/16	"	60 to 72	"	
5	15/16	"	74 to 96	"	

Lever and boxing are included in below mentioned prices.

To get the benefit of our guarantee it is necessary to state, in ordering, whether Friction Clutch Pulleys are for single or double-belt duty.

Fulcrum Stands are not included in these prices.

Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
10	3	Abdomen...	16	\$26 40	\$26 80	13	6	Ammonia...	19	\$34 40	\$37 00
	4	Absorbent...	17	27 50	28 00		8	Andiron...	21	38 20	40 60
	5	Accessory...	18	28 70	30 20		10	Aniline...	23	41 00	44 30
	6	Accumulate...	19	30 50	32 70		3	Annealor...	16	29 40	29 80
	8	Acetate...	21	32 80	36 30	14	4	Antique...	17	30 70	31 10
11	3	Acetone...	16	27 10	27 50		5	Antiseptic...	18	32 40	34 50
	4	Acoustic...	17	28 20	28 60		6	Apparatus...	19	35 50	38 00
	5	Adding...	18	29 50	30 80		8	Asbestos...	21	39 00	41 50
	6	Adhesive...	19	31 30	34 00		10	Asphalt...	23	41 90	45 10
	8	Advertiser...	21	34 00	37 90	15	12	Atomizer...	25	44 50	48 80
12	3	Aerial...	16	27 90	28 30		4	Attachment...	16	30 20	30 60
	4	Afghans...	17	29 00	29 40		4	Auction...	17	31 50	32 00
	5	Agaric...	18	30 30	32 00		5	Automatic...	18	34 20	35 50
	6	Agate...	19	32 40	35 40		6	Apples...	19	37 30	39 10
	8	Agriculture...	21	36 00	39 60	16	8	Aquaria...	23	40 80	43 90
13	10	Alloys...	23	39 70	43 30		10	Arabesque...	25	42 90	47 90
	3	Alpaca...	16	28 60	29 00		12	Arbors...	25	47 00	52 00
	4	Alphabet...	17	29 80	30 20		16	Archery...	16	31 00	31 40
	5	Aluminum...	18	31 20	33 50		3	Arches...	17	32 40	32 90

For Cuts and Description see pages 47 and 54.



Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
16	5	Architects ....	18	\$35 00	\$36 70	23	12	Bromine ....	23	\$63 00	\$69 30
	6	Arctic ....	19	39 00	40 70		14	Bronze ....	27	68 00	75 30
	8	Armlets ....	21	42 00	44 80		16	Buckets ....	29	76 00	84 00
	10	Armories ....	23	45 00	49 00		18	Buckles ....	33	84 00	92 50
	12	Arresters ....	25	49 00	54 60		24	Buffing ....	17	42 30	43 50
	14	Artesian ....	27	54 00	61 60		5	Buggy ....	15	46 70	49 10
17	3	Bagasse ....	16	31 70	32 20		6	Builders ....	19	51 50	55 00
	4	Bagatelle ....	17	33 20	33 70		8	Bumpers ....	21	57 00	61 00
	5	Baking ....	18	35 50	37 50		10	Burlaps ....	23	63 00	67 10
	6	Balmoral ....	19	39 50	41 50		12	Burners ....	25	68 00	73 30
	8	Banding ....	21	42 60	45 60		14	Business ....	27	73 00	79 60
	10	Banjo ....	23	45 60	49 80		16	Buskins ....	29	79 00	87 00
	12	Barrows ....	25	50 00	55 40		18	Buttons ....	33	87 00	96 00
	14	Basins ....	27	54 50	62 40		20	Cabinet ....	35	96 00	105 00
18	3	Basque ....	16	32 30	32 80		25	Caddies ....	17	45 00	46 50
	4	Beading ....	17	33 90	34 40		5	Cakes ....	18	50 00	53 00
	5	Beaters ....	19	36 00	38 50		6	Caldron ....	19	55 80	59 50
	6	Bedstead ....	19	40 00	42 60		8	Caligraph ....	21	61 00	65 25
	8	Belaying ....	21	44 00	47 00		10	Caloric ....	23	67 00	72 00
	10	Bellows ....	23	48 00	52 00		12	Cambric ....	25	73 25	78 75
	12	Benches ....	25	52 50	57 20		14	Camera ....	27	80 00	85 50
	14	Berry ....	27	57 00	64 20		16	Candle ....	29	86 00	92 50
	16	Bicycle ....	29	61 50	71 30		18	Canes ....	33	94 00	101 00
19	4	Biggins ....	17	34 50	35 10		20	Canister ....	35	103 00	111 00
	5	Billiard ....	18	37 00	39 50		26	Canker ....	17	46 00	48 50
	6	Bindings ....	19	41 00	44 10		5	Canning ....	18	52 00	55 00
	8	Birch ....	21	45 00	48 70		6	Cannon ....	19	58 00	62 00
	10	Birthday ....	23	51 00	55 00		8	Canvas ....	21	64 00	69 25
	12	Biscuit ....	25	55 00	61 40		10	Capstan ....	23	71 00	76 50
	14	Bitters ....	27	60 00	68 00		12	Capsules ....	25	77 50	83 75
	16	Blanket ....	29	66 50	74 50		14	Carbonate ....	27	83 00	90 00
20	4	Blast ....	17	35 30	35 90		16	Cardboard ....	29	88 50	96 00
	5	Blasting ....	18	37 80	40 40		18	Carriage ....	33	98 00	106 00
	6	Bleachers ....	19	42 00	45 10		20	Cartoon ....	35	108 00	117 00
	8	Blinds ....	21	47 00	51 00		27	Cartridge ....	17	48 50	51 00
	10	Blotters ....	23	52 00	56 00		5	Casket ....	18	54 00	57 00
	12	Blowers ....	25	56 00	62 10		6	Catarrh ....	19	60 00	65 00
	14	Bluing ....	27	61 00	66 00		8	Caustic ....	21	66 00	71 00
	16	Bobbins ....	29	66 60	77 60		10	Cellar ....	23	72 50	78 00
21	4	Boilers ....	17	36 80	37 50		12	Celluloid ....	25	78 00	84 00
	5	Bolting ....	18	40 00	42 10		14	Cemetery ....	27	84 50	91 00
	6	Bonnet ....	19	44 10	47 50		16	Centering ....	29	91 00	98 00
	8	Borders ....	21	48 20	53 00		18	Cesspool ....	33	101 00	109 00
	10	Boring ....	23	53 00	58 00		20	Chafing ....	35	114 00	123 00
	12	Botanical ....	25	57 00	64 50		4	Charcoal ....	17	51 00	53 50
	14	Bottle ....	27	63 50	71 50		5	Chemical ....	18	56 00	59 50
	16	Bottoms ....	29	72 00	82 50		6	Cheviots ....	19	61 50	67 00
22	4	Boxing ....	17	37 80	38 50		8	Children ....	21	67 00	73 00
	5	Bracelet ....	18	41 40	43 60		10	Chimes ....	23	73 00	79 00
	6	Braiders ....	19	45 50	49 00		12	Chinchilla ....	25	79 00	85 00
	8	Brandied ....	21	50 00	54 50		14	Chloride ....	27	86 00	95 00
	10	Brazing ....	23	55 00	60 10		16	Chocolate ....	29	94 00	103 00
	12	Breakers ....	25	60 00	66 00		18	Choppers ....	33	104 00	116 00
	14	Breakfast ....	27	65 00	72 00		20	Chromo ....	35	116 00	129 00
	16	Brewers ....	29	71 00	83 00		29	Churns ....	17	53 50	56 00
	18	Brewery ....	33	80 00	90 00		5	Cigarette ....	18	58 00	62 00
23	4	Briarwood ....	17	39 70	40 50		6	Circular ....	19	63 00	68 00
	5	Bridges ....	18	43 80	46 00		8	Cistern ....	21	68 00	74 00
	6	Brittania ....	19	48 00	51 60		10	Clapboard ....	23	74 50	81 00
	8	Broaches ....	21	53 00	57 40		12	Clappers ....	25	80 00	88 00
	10	Brogans ....	23	58 00	63 30		14	Clarifiers ....	27	89 00	98 00

Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
30	16	Clasps.....	29	\$95 50	\$105 00	35	18	Detector.....	33	\$127 00	\$144 00
	18	Classifiers....	33	107 00	120 00		20	Devices.....	35	142 00	162 00
	20	Cleaners.....	35	120 50	134 00		4	Digger.....	17	66 50	71 50
	4	Cleives.....	17	55 50	58 50		5	Dippers.....	18	74 50	80 00
	5	Cloaking.....	18	59 00	63 50		6	Distillery.....	19	81 00	88 00
	6	Closets.....	19	64 00	70 00		8	Ditchers.....	21	87 00	95 00
	8	Clothes.....	21	70 00	76 50		10	Documents.....	23	97 00	107 00
	10	Clothing.....	23	77 00	84 00		12	Domestic.....	25	104 00	118 00
	12	Cocaine.....	25	83 50	91 00		14	Dominoes.....	27	113 00	128 00
	14	Cologne.....	27	93 00	101 00		16	Dowel.....	29	122 00	138 00
31	16	Colored.....	29	99 50	108 00	36	18	Drainers.....	33	133 00	150 00
	18	Combing.....	33	111 00	124 00		20	Drawers.....	35	152 00	172 00
	20	Commode.....	35	125 00	139 00		22	Dredging.....	37	165 00	188 00
	4	Concrete.....	17	56 00	59 50		24	Dresser.....	39	175 00	205 00
	5	Condenser.....	18	60 50	65 00		4	Dulciners.....	18	69 50	74 00
	6	Conduits.....	19	66 50	73 00		5	Dusters.....	19	77 00	82 00
	8	Conical.....	21	72 00	79 00		6	Dyewood.....	20	83 00	90 00
	10	Consumers.....	23	79 00	87 00		8	Dynamite.....	22	90 00	98 00
	12	Contractor.....	25	85 50	94 00		10	Dynamos.....	25	101 00	110 00
	14	Converter.....	27	95 00	104 00		12	Earrings.....	27	107 00	121 00
32	16	Convex.....	29	102 00	112 00	38	14	Earthen.....	29	118 00	134 00
	18	Conveyor.....	33	114 00	128 00		16	Edging.....	31	127 00	144 00
	20	Cooling.....	35	130 00	144 00		18	Ejectors.....	33	141 00	159 00
	4	Cooperage.....	17	58 00	61 50		20	Elastic.....	35	156 00	181 00
	5	Copying.....	18	63 00	67 50		22	Elbows.....	37	168 00	194 00
	6	Coral.....	19	69 00	76 00		24	Elevator.....	39	183 00	214 00
	8	Cordage.....	21	74 00	82 00		4	Elixirs.....	18	71 00	76 50
	10	Corkscrew.....	23	81 00	90 00		5	Embalmer.....	19	78 50	84 50
	12	Corrugate.....	25	89 00	99 00		6	Embossed.....	20	86 00	93 00
	14	Corsets.....	27	97 50	108 00		8	Endless.....	22	94 00	103 00
33	16	Corundum.....	29	106 00	118 00	40	10	Engine.....	25	104 00	114 00
	18	Cosmetics.....	33	118 00	133 00		12	Epaulet.....	27	111 00	126 00
	20	Costumes.....	35	134 00	149 00		14	Erasers.....	29	123 00	139 00
	4	Coverer.....	17	60 00	63 50		16	Essences.....	31	135 00	152 00
	5	Cowhide.....	18	65 00	70 00		18	Etching.....	33	148 00	166 00
	6	Crackers.....	19	71 00	78 00		20	Excelsior.....	35	163 00	188 00
	8	Crashes.....	21	77 00	85 00		22	Exhaust.....	37	177 00	203 00
	10	Crayon.....	23	84 50	93 00		24	Expense.....	39	192 00	224 00
	12	Creepers.....	25	92 00	104 00		4	Export.....	18	73 50	79 50
	14	Cresopite.....	27	103 00	115 00	42	5	Extractor.....	19	81 00	87 00
34	16	Crimpers.....	29	111 00	124 00		6	Eyelet.....	20	89 00	96 00
	18	Crinoline.....	33	121 00	135 00		8	Fancy.....	22	97 00	107 00
	20	Croquet.....	35	137 00	154 00		10	Farina.....	25	106 00	117 00
	4	Crushers.....	17	61 50	65 50		12	Fasteners.....	27	116 00	129 00
	5	Crutches.....	18	66 50	72 50		14	Faucets.....	29	124 00	145 00
	6	Cuffs.....	19	72 50	80 00		16	Felloe.....	31	137 00	160 00
	8	Cultivator.....	21	78 00	86 00		18	Fender.....	33	150 00	174 00
	10	Cupboard.....	23	88 00	97 00		20	Fertilizer.....	35	169 00	196 00
	12	Cupola.....	25	95 00	108 00		22	Fibre.....	37	186 00	214 00
	14	Curiers.....	27	105 00	119 00	44	24	Fibrous.....	39	203 00	235 00
35	16	Curriers.....	29	113 00	128 00		4	Firepot.....	18	77 00	83 00
	18	Curtain.....	33	124 00	140 00		5	Fireproof.....	19	84 00	91 00
	20	Cushions.....	35	139 00	158 00		6	Fixtures.....	20	91 00	100 00
	4	Cutlery.....	17	63 50	68 00		8	Flageolet.....	22	101 00	111 00
	5	Cylinders.....	18	69 00	75 00		10	Flannel.....	25	110 00	122 00
	6	Cymbals.....	19	76 00	83 00		12	Flexible.....	27	120 00	134 00
	8	Damask.....	21	81 00	89 00		14	Flooring.....	29	133 00	151 00
	10	Daubers.....	23	91 00	100 00		16	Floral.....	31	142 00	167 00
	12	Deflector.....	25	97 00	111 00		18	Folders.....	33	159 00	184 00
	14	Derrick.....	27	107 00	122 00		20	Forging.....	35	173 00	203 00
36	16	Destroyer.....	29	116 00	132 00		22	Fusible.....	37	193 00	223 00

Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
41	24	Galloon.....	39	\$215 00	\$246 00	54	24	Jaggers.....	40	\$270 00	\$311 00
40	4	Galvanic.....	18	81 00	87 00	26	26	Japanese.....	42	299 00	344 00
6	6	Garment.....	19	88 00	95 50	28	28	Jewelers.....	44	337 00	383 00
6	6	Glassware.....	20	95 00	105 00	30	30	Jointers.....	46	377 00	424 00
8	8	Glazier.....	22	104 00	115 00	6	6	Jute.....	21	115 00	128 00
10	10	Gondola.....	25	114 00	126 00	8	8	Juvenile.....	23	128 00	142 00
12	12	Gopher.....	27	126 00	139 00	10	10	Kalsomine.....	25	141 00	156 00
14	14	Governor.....	29	140 00	156 00	12	12	Kaolin.....	27	155 00	171 00
16	16	Graphite.....	31	150 00	173 00	14	14	Kerosene.....	29	167 00	190 00
18	18	Graters.....	33	166 00	190 00	16	16	Kettle.....	31	179 00	209 00
20	20	Grating.....	35	182 00	210 00	18	18	Killers.....	33	200 00	231 00
22	22	Gravity.....	37	202 00	231 00	20	20	Kindlers.....	35	224 00	256 00
24	24	Griddles.....	39	226 00	259 00	22	22	Kitchen.....	37	250 00	287 00
48	6	Grinders.....	21	99 00	113 00	24	24	Knapsack.....	40	280 00	321 00
8	8	Grocers.....	23	113 00	127 00	26	26	Knitters.....	42	308 00	352 00
10	10	Guano.....	25	123 00	138 00	28	28	Knives.....	44	349 00	393 00
12	12	Gudgeons.....	27	133 00	149 00	30	30	Knuckle.....	46	383 00	438 00
14	14	Gunning.....	29	150 00	167 00	6	6	Lacing.....	21	116 00	130 00
16	16	Gutters.....	31	160 00	185 00	8	8	Lacquers.....	23	129 00	144 00
18	18	Gypsum.....	33	176 00	202 00	10	10	Ladders.....	25	144 00	161 00
20	20	Hackers.....	35	194 00	223 00	12	12	Lagging.....	27	156 00	178 00
22	22	Hammock.....	37	214 00	244 00	14	14	Lamps.....	29	169 00	196 00
24	24	Hampers.....	40	238 00	276 00	16	16	Landau.....	31	181 00	215 00
26	26	Handles.....	42	269 00	309 00	18	18	Lariats.....	33	205 00	240 00
28	28	Hardware.....	44	303 00	344 00	20	20	Lassos.....	35	230 00	266 00
30	30	Harness.....	46	341 00	384 00	22	22	Latches.....	38	261 00	300 00
50	6	Harpoon.....	21	104 00	118 00	24	24	Lattice.....	41	293 00	333 00
8	8	Harrow.....	23	117 00	132 00	26	26	Launches.....	43	314 00	364 00
10	10	Headers.....	25	128 00	144 00	28	28	Laundry.....	45	351 00	405 00
12	12	Hemacite.....	27	138 00	155 00	30	30	Lavender.....	47	393 00	451 00
14	14	Hexagon.....	29	156 00	175 00	6	6	Leading.....	23	124 00	140 00
16	16	Historical.....	31	165 00	193 00	8	8	Leather.....	25	137 00	154 00
18	18	Hoisting.....	33	182 00	211 00	10	10	Legal.....	27	151 00	171 00
20	20	Holders.....	35	202 00	233 00	12	12	Leggins.....	29	163 00	191 00
22	22	Hominy.....	37	224 00	256 00	14	14	Licorice.....	31	180 00	210 00
24	24	Hoopskirt.....	40	247 00	290 00	16	16	Lifters.....	33	191 00	231 00
26	26	Hosiery.....	42	278 00	322 00	18	18	Lighters.....	35	216 00	257 00
28	28	Hospital.....	44	314 00	359 00	20	20	Linen.....	38	246 00	293 00
30	30	Hotel.....	46	350 00	399 00	22	22	Linoleum.....	40	254 00	332 00
52	6	Hurricane.....	21	108 00	122 00	24	24	Linseed.....	42	305 00	360 00
8	8	Hydrant.....	23	121 00	136 00	26	26	Linsey.....	44	331 00	391 00
10	10	Images.....	25	132 00	148 00	28	28	Liquid.....	46	371 00	432 00
12	12	Imitation.....	27	143 00	160 00	30	30	Loadstone.....	48	415 00	478 00
14	14	Imperial.....	29	160 00	180 00	6	6	Logging.....	23	130 00	149 00
16	16	Incense.....	31	170 00	198 00	8	8	Looms.....	25	144 00	164 00
18	18	Inclined.....	33	188 00	217 00	10	10	Loop.....	27	158 00	181 00
20	20	Incubator.....	35	207 00	240 00	12	12	Lounges.....	29	173 00	201 00
22	22	Indelible.....	37	233 00	266 00	14	14	Lozenge.....	31	191 00	222 00
24	24	Index.....	40	258 00	300 00	16	16	Luminous.....	33	204 00	244 00
26	26	Indicating.....	42	287 00	332 00	18	18	Macaroni.....	35	230 00	271 00
28	28	Indigo.....	44	320 00	369 00	20	20	Magnesia.....	38	260 00	308 00
30	30	Induction.....	46	361 00	410 00	22	22	Majolica.....	40	290 00	338 00
54	6	Ingot.....	21	112 00	126 00	24	24	Malleable.....	42	318 00	376 00
8	8	Inkstand.....	23	125 00	140 00	26	26	Mandolin.....	44	345 00	408 00
10	10	Insect.....	25	136 00	152 00	28	28	Manhole.....	46	383 00	449 00
12	12	Inserted.....	27	146 00	163 00	30	30	Manicure.....	48	425 00	494 00
14	14	Inside.....	29	165 00	183 00	6	6	Manitold.....	23	135 00	158 00
16	16	Insoles.....	31	175 00	204 00	8	8	Mantel.....	25	153 00	174 00
18	18	Invalid.....	33	194 00	224 00	10	10	Manure.....	27	167 00	191 00
20	20	Isinglass.....	35	214 00	240 00	12	12	Marine.....	29	185 00	212 00
22	22	Ivory.....	37	244 00	280 00	14	14	Mashers.....	31	201 00	235 00



Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
64	16	Matches.....	33	\$216 00	\$258 00	72	36	Pendants.....	56	\$604 00	\$709 00
	18	Mattock.....	35	243 00	286 00		8	Pepsine.....	26	204 00	239 00
	20	Mattress.....	38	275 00	322 00		10	Perfume.....	28	223 00	259 00
	22	Mercury.....	40	305 00	353 00		12	Pestles.....	30	242 00	281 00
	24	Metallic.....	42	331 00	391 00		14	Petroleum.....	32	269 00	315 00
	26	Metric.....	44	358 00	423 00		16	Phosphate.....	34	285 00	343 00
	28	Mica.....	46	396 00	465 00		18	Piano.....	36	315 00	374 00
	30	Military.....	48	437 00	510 00		20	Piazza.....	40	347 00	415 00
	6	Millinery.....	23	142 00	166 00		22	Picture.....	42	380 00	448 00
	8	Mirrors.....	25	159 00	184 00	76	24	Pigeon.....	44	411 00	484 00
66	10	Mitre.....	27	174 00	202 00		26	Pillows.....	46	442 00	525 00
	12	Mixers.....	29	192 00	224 00		28	Pitcher.....	48	479 00	564 00
	14	Moccasin.....	31	211 00	248 00		30	Placques.....	50	507 00	602 00
	16	Model.....	33	229 00	272 00		32	Planers.....	52	552 00	649 00
	18	Mohair.....	35	255 00	301 00		34	Platers.....	54	588 00	695 00
	20	Morocco.....	38	286 00	338 00		36	Plumbago.....	56	624 00	741 00
	22	Mosquito.....	40	316 00	369 00		8	Plumbers.....	26	215 00	254 00
	24	Motors.....	42	345 00	407 00		10	Pointers.....	28	234 00	275 00
	26	Moulders.....	44	373 00	440 00		12	Polo.....	30	253 00	297 00
	28	Mowers.....	46	411 00	482 00	78	14	Popcorn.....	32	280 00	330 00
68	30	Mucilage.....	48	450 00	526 00		16	Porcelain.....	34	306 00	359 00
	6	Muddlers.....	24	151 00	179 00		18	Portable.....	36	328 00	392 00
	8	Multiple.....	26	170 00	199 00		20	Postal.....	40	370 00	437 00
	10	Mungoes.....	28	188 00	219 00		22	Potash.....	42	395 00	472 00
	12	Municipal.....	30	206 00	239 00		24	Poultry.....	44	427 00	508 00
	14	Musical.....	32	227 00	262 00		26	Preserves.....	46	459 00	552 00
	16	Mustache.....	34	248 00	293 00		28	Pressure.....	48	495 00	592 00
	18	Muzzles.....	36	275 00	321 00		30	Propeller.....	50	524 00	625 00
	20	Napkins.....	40	298 00	362 00		32	Pudding.....	52	564 00	671 00
	22	Naphtha.....	42	338 00	394 00	80	34	Purifier.....	54	607 00	715 00
70	24	Nautical.....	44	363 00	429 00		36	Rattan.....	56	644 00	764 00
	26	Necklace.....	46	391 00	465 00		8	Katellers.....	26	224 00	263 00
	28	Necktie.....	48	430 00	506 00		10	Rawhide.....	28	245 00	288 00
	30	Needles.....	50	467 00	549 00		12	Reamers.....	30	262 00	316 00
	6	Nippers.....	24	159 00	188 00		14	Regalia.....	32	294 00	349 00
	8	Nitrate.....	26	178 00	208 00		16	Replacers.....	34	321 00	380 00
	10	Noiseless.....	28	196 00	228 00		18	Ribbon.....	36	350 00	412 00
	12	Notary.....	30	216 00	249 00		20	Rockers.....	40	393 00	456 00
	14	Novelty.....	32	239 00	277 00		22	Roofers.....	42	419 00	492 00
	16	Nursery.....	34	261 00	306 00	82	24	Rotary.....	44	449 00	532 00
72	18	Oblong.....	36	289 00	335 00		26	Rubler.....	46	485 00	572 00
	20	Ochre.....	40	311 00	374 00		28	Rulers.....	48	520 00	612 00
	22	Octave.....	42	347 00	406 00		30	Runners.....	50	547 00	644 00
	24	Onyx.....	44	375 00	442 00		32	Rustic.....	52	596 00	701 00
	26	Opera.....	46	401 00	479 00		34	Safety.....	54	639 00	744 00
	28	Ordnance.....	48	440 00	520 00		36	Salad.....	56	671 00	788 00
	30	Ostrich.....	50	478 00	562 00		10	Saloon.....	28	252 00	297 00
	8	Outsole.....	26	186 00	219 00		12	Sardine.....	30	280 00	332 00
	10	Overall.....	28	204 00	239 00		14	Sassafras.....	32	312 00	370 00
	12	Overhead.....	30	227 00	262 00	84	16	Scaffold.....	34	343 00	406 00
74	14	Overshoe.....	32	250 00	293 00		18	Scourers.....	36	375 00	442 00
	16	Oyster.....	34	272 00	320 00		20	Scrapers.....	40	415 00	492 00
	18	Package.....	36	301 00	351 00		22	Sectional.....	42	449 00	532 00
	20	Pamphlet.....	40	324 00	391 00		24	Separator.....	44	481 00	569 00
	22	Pantry.....	42	361 00	424 00		26	Sewerage.....	46	517 00	614 00
	24	Parallel.....	44	390 00	462 00		28	Sheathing.....	48	551 00	654 00
	26	Parasol.....	46	420 00	497 00		30	Shoddy.....	50	584 00	695 00
	28	Parchment.....	48	458 00	538 00		32	Shucks.....	52	624 00	732 00
	30	Parlor.....	50	492 00	579 00		34	Siamese.....	54	659 00	782 00
	32	Pastry.....	52	532 00	624 00		36	Sidewalk.....	56	694 00	823 00
76	34	Pavilion.....	54	572 00	671 00		10	Skewers.....	29	260 00	306 00



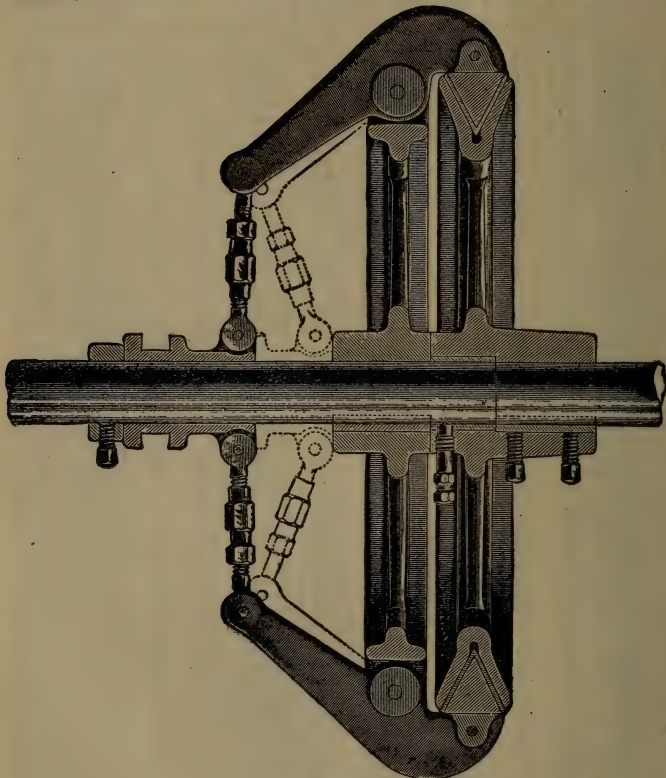
Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.		Diameter.	Face.	CIPHER.	Space on Shaft.	PRICE.	
				Single Belt.	Double Belt.					Single Belt.	Double Belt.
82	12	Slasher.....	31	\$287 00	\$342 00	90	12	Tinware.....	31	\$320 00	\$378 00
	14	Slippers.....	33	321 00	380 00		14	Toggles.....	33	361 00	427 00
	16	Soapstone.....	34	351 00	417 00		16	Toilets.....	34	397 00	472 00
	18	Society.....	36	384 00	458 00		18	Traction.....	36	436 00	518 00
	20	Sorghum.....	40	427 00	506 00		20	Trammel.....	40	490 00	574 00
	22	Spatulas.....	42	462 00	548 00		22	Tramway.....	42	520 00	625 00
	24	Speaking.....	44	497 00	590 00		24	Transfer.....	44	560 00	667 00
	26	Specialties.....	46	536 00	636 00		26	Transom.....	46	609 00	718 00
	28	Specimen.....	48	570 00	676 00		28	Travelers.....	48	655 00	765 00
	30	Spectacles.....	51	606 00	720 00		30	Travelse.....	51	690 00	813 00
	32	Speeder.....	53	646 00	767 00		32	Trellis.....	53	732 00	868 00
	34	Spinal.....	55	682 00	810 00		34	Trestle.....	55	779 00	917 00
84	36	Spindle.....	57	716 00	849 00		36	Triangle.....	57	820 00	970 00
	10	Spiral.....	29	265 00	314 00	92	10	Tricycle.....	29	294 00	347 00
	12	Spittoons.....	31	295 00	355 00		12	Trimmers.....	31	330 00	388 00
	14	Sponges.....	33	330 00	392 00		14	Tripod.....	33	370 00	437 00
	16	Spreaders.....	36	364 00	430 00		16	Trowel.....	34	412 00	487 00
	18	Sprinklers.....	39	398 00	472 00		18	Tubing.....	36	449 00	535 00
	20	Squaring.....	40	442 00	523 00		20	Tubular.....	40	506 00	596 00
	22	Squeezers.....	42	478 00	565 00		22	Tumbler.....	42	540 00	643 00
	24	Squirrel.....	44	516 00	610 00		24	Tunneling.....	44	580 00	688 00
	26	Stabbing.....	46	558 00	656 00		26	Turret.....	46	625 00	739 00
	28	Statuary.....	48	603 00	703 00		28	Tuyere.....	48	672 00	788 00
	30	Stirrups.....	51	630 00	744 00		30	Tweezers.....	51	711 00	839 00
	32	Strainers.....	53	669 00	793 00		32	Twisters.....	53	754 00	894 00
	34	Strapping.....	55	707 00	840 00		34	Umbrella.....	55	802 00	944 00
86	36	Stratena.....	57	742 00	882 00		36	Universal.....	57	844 00	995 00
	10	Stringers.....	29	273 00	323 00	94	10	Upright.....	29	302 00	356 00
	12	Stretchers.....	31	304 00	364 00		12	Upsetters.....	31	341 00	402 00
	14	Students.....	33	340 00	403 00		14	Utensils.....	33	380 00	452 00
	16	Substitute.....	34	375 00	444 00		16	Vacine.....	34	424 00	502 00
	18	Sucker.....	36	410 00	486 00		18	Vacuum.....	36	467 00	550 00
	20	Sulphate.....	40	456 00	540 00		20	Valise.....	40	522 00	606 00
	22	Supplies.....	42	494 00	590 00		22	Varnish.....	42	554 00	659 00
	24	Supports.....	44	533 00	638 00		24	Vegetable.....	44	600 00	710 00
	26	Surface.....	46	570 00	676 00		26	Veiling.....	46	647 00	763 00
	28	Surgeons.....	48	618 00	725 00		28	Veneer.....	48	694 00	813 00
	30	Surgical.....	51	648 00	766 00		30	Venetian.....	52	736 00	869 00
	32	Suspender.....	53	690 00	817 00		32	Veranda.....	54	784 00	925 00
	34	Sweepers.....	55	728 00	866 00		34	Vertical.....	56	832 00	975 00
	36	Switches.....	57	767 00	911 00		36	Vessels.....	58	870 00	1030 00
88	10	Swivel.....	29	280 00	331 00	96	10	Vinegar.....	29	310 00	366 00
	12	Syringe.....	31	311 00	370 00		12	Vitrihed.....	31	351 00	416 00
	14	System.....	33	350 00	415 00		14	Vitriol.....	33	392 00	466 00
	16	Tablets.....	34	386 00	459 00		16	Voltaic.....	34	438 00	519 00
	18	Tallow.....	36	423 00	503 00		18	Voucher.....	36	476 00	568 00
	20	Tassel.....	40	474 00	559 00		20	Washers.....	40	538 00	630 00
	22	Testers.....	42	511 00	611 00		22	Waxwork.....	42	584 00	684 00
	24	Thimble.....	44	547 00	651 00		24	Weaners.....	44	630 00	734 00
	26	Thread.....	46	592 00	700 00		26	Weathers.....	46	671 00	786 00
	28	Threaders.....	48	637 00	747 00		28	Webbing.....	48	717 00	836 00
	30	Throat.....	51	669 00	796 00		30	Weeding.....	52	767 00	896 00
	32	Throttle.....	53	709 00	849 00		32	Weighing.....	54	815 00	953 00
	34	Tickets.....	55	754 00	896 00		34	Welders.....	56	864 00	1004 00
	36	Tincture.....	57	791 00	946 00		36	Whetstone.....	58	906 00	1060 00
90	10	Tinners.....	29	287 00	338 00						

For Cuts and Description see pages 47 and 51.

## FRICITION CLUTCH COUPLINGS.

FOR PRICE LIST SEE PAGE 56.

Our Friction Clutch Couplings are made on the same general principle as our Friction Clutch Pulleys, and are guaranteed to transmit the horse power as specified in list. We guarantee them fully as to strength, workmanship and operation, and will replace them free of charge.



CUT NO. 5. FRICTION CLUTCH COUPLING.  
(PATENTED.)

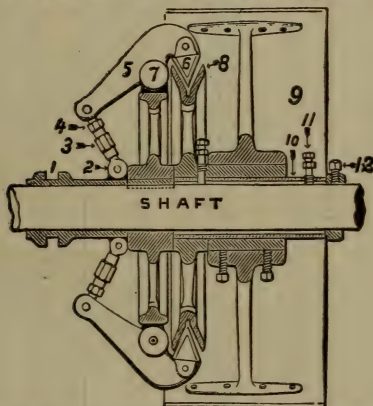
paying freight both ways, or refund the money paid should they not come up to our representations in every particular. They are the simplest, strongest and best Friction Clutch Couplings on the market, and, like our Friction Clutch Pulleys, occupy very little space on the shaft, and are thoroughly tested before sending out. They are self-locking, and can be started and stopped gradually and without shock or jar. When they are not required to transmit the full power of shaft it is necessary that we know the speed of shaft and horse-power wanted. We can then make prices corresponding to the requirements.

## THESE INSTRUCTIONS MUST BE FOLLOWED TO SECURE GOOD SERVICE.

### DIRECTIONS FOR PUTTING UP FRICTION CLUTCHES.

Our Friction Clutches are sent out from factory with all adjustments properly made, and when placed in position on the shaft they are ready for use.

When it is necessary to key seat the shaft for the fulcrum wheel (7) the key-seat should be cut  $\frac{1}{4}$ -inch less in length than the length of the hub of the fulcrum wheel. The key-seat should commence at the end of the hub of the sheave and extend toward the lever side of the Clutch. For safety in shipping, the pulley and the sheave are sometimes separated. When so received, be guided by the marks on each in placing them together. The shaft where the



pulley is to run should be clean and smooth, and the shaft and sleeve should be thoroughly lubricated before placing the pulley in position. To connect lever (5) with sheave remove the pins at "7" and place shoes "6" in sheave, then replace the pins at "7." A bolt which acts as a stop for the slide-collar connects the slide-collar with the hub of the fulcrum wheel. Be careful to have this bolt screwed into the fulcrum wheel as far as it will go. A collar, to be placed at the end of the sleeve of the pulley, is sent with each Clutch. In making adjustments to take up wear, loosen the jam nuts (4) and turn the adjusting nuts (3) in the direction in which the arrow points. Care must be taken not to turn these nuts too far, as one-third of a turn is sufficient to make a great difference in the power necessary to be applied at the end of the lever. Be careful to adjust all nuts equally and when the adjustment is properly made the space between the shaft and the slide-collar will be the same at all points. Before starting the Clutch be sure that the rotating parts will not strike the lever. Keep the sleeve well lubricated. The figures stamped on end of lever indicate about the pounds pressure that should be applied at that point.

If Clutch chatters wipe friction surface of V-shaped sheave occasionally with an oily rag or oily waste.

**3-MOVE LEVER IN GRADUALLY WHEN ENGAGING CLUTCH.**

### REFERENCE MARKS.

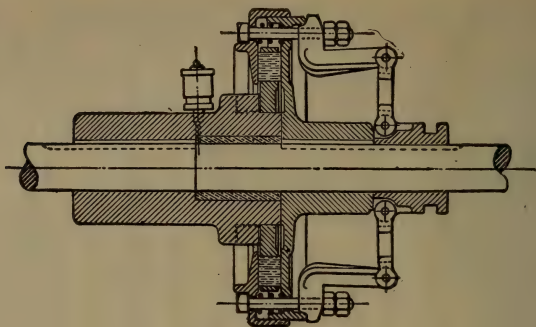
- |                 |                  |                  |                    |
|-----------------|------------------|------------------|--------------------|
| 1 Slide-Collar. | 2 Link.          | 3 Adjusting Nut. | 4 Jam Nut.         |
| 5 Fulcrum Arms. | 6 Friction Shoe. | 7 Fulcrum Wheel. | 8 V-shaped Sheave. |
| 9 Pulley.       | 10 Sleeve.       | 11 Lubricator.   | 12 Set-collar.     |





Diam. of Shaft.	CIPHER.	Diameter of Clutch.	SPACE ON SHAFT.		Horse Power at 100 Rev's.	PRICE.	
			Sheave Side.	Lever Side.		Not Fitted on Shaft.	Fitted on Shaft.
3 15/16	Baggott .....	28	6 1/2	18	55	122 00	132 00
	Baghigh .....	30	7	18	65	128 00	138 00
	Baginess .....	32*	7	18	75	137 00	147 00
	Bagshaw .....	34	7	19	85	147 00	159 00
4 3/16	Baiser .....	36	7	19	100	161 00	173 00
	Bakewell .....	20	6	17	25	108 00	116 00
	Ballman .....	22	6	17 1/2	30	112 00	120 00
	Balmer .....	24	6	17 1/2	35	117 00	127 00
	Balzane .....	26	6 1/2	18	45	122 00	132 00
	Bambrick .....	28	6 1/2	18	55	128 00	140 00
	Bamcord .....	30	7	18	65	134 00	146 00
	Bampoint .....	32.	7	18	75	144 00	156 00
	Banister .....	34*	7	19	85	155 00	167 00
	Bannock .....	36	7	20	100	168 50	181 00
	Bannon .....	20	6 1/2	18	25	115 00	123 00
	Barada .....	22	6 1/2	18	30	118 00	126 00
4 7/16	Barnhart .....	24	6 1/2	18	35	122 00	132 00
	Barnlot .....	26	6 1/2	18	45	128 00	138 00
	Barnwell .....	28	7	18 1/2	55	134 00	146 00
	Barnyard .....	30	7	18 1/2	65	141 00	153 00
	Barabee .....	32	7	18 1/2	75	156 00	168 00
	Baron .....	34	7	19	85	170 00	181 00
	Baronial .....	36*	7	20	100	184 00	198 00
	Barrett .....	40	7	20	125	213 00	229 00
4 11/16	Basilary .....	44	7	22	150	244 00	260 00
	Bass .....	24	6 1/2	18	35	128 00	140 00
	Bassfish .....	26	6 1/2	18	45	134 00	146 00
	Bastian .....	28	7	18 1/2	55	140 00	154 00
	Batement .....	30	7	18 1/2	65	147 00	161 00
	Batgame .....	32	7	19	75	162 00	176 00
	Bath .....	34	7	20	85	176 00	192 00
	Bathroom .....	36	7	20	100	191 00	207 00
4 15/16	Bauer .....	40*	7	20	125	221 00	239 00
	Baufait .....	44	7	22	150	255 00	273 00
	Baumont .....	24	6 1/2	19	35	133 00	147 00
	Bawling .....	26	6 1/2	20	45	140 00	154 00
	Bayless .....	28	7	20	55	146 00	162 00
	Baypoint .....	30	7	21	65	154 00	170 00
	Beaconage .....	32	7	21	75	168 00	184 00
	Beadle .....	34	7	22	85	184 00	200 00
5 1/16	Beauteous .....	36	7	22	100	199 00	217 00
	Beckman .....	40	7	23	125	229 00	247 00
	Becoming .....	44*	7	24	150	263 00	283 00
	Belding .....	28	7	21	55	156 00	172 00
	Bellringer .....	30	7	21	65	167 00	183 00
	Belvedere .....	32	7	22	75	181 00	197 00
	Benedict .....	34	7	22	85	197 00	213 00
	Beneficient .....	36	7	24	100	213 00	231 00
5 15/16	Benjamin .....	40	7	24	125	243 00	261 00
	Benkin .....	44	7 1/2	25	150	276 00	296 00
	Benton .....	48*	8	26	200	311 00	333 00
	Bergens .....	54	9	27	275	362 00	386 00
	Bergeret .....	60	10	28	400	410 00	441 00
	Beverage .....	30	7	21	65	179 00	199 00
	Bewilder .....	32	7	22	75	194 00	214 00
	Biggers .....	34	7	22	85	210 00	230 00
6 15/16	Billions .....	36	7	24	100	226 00	248 00
	Bischoff .....	40	7	25	125	258 00	280 00
	Bitterness .....	44	8	26	150	291 00	317 00
	Blackmer .....	48	8	26	200	327 00	355 00
	Blattner .....	54*	9	27	275	377 00	409 00
	Block .....	60	10	28	400	427 00	466 00
	Blindfold .....	30	7 1/2	22	65	223 00	247 00
	Bludgeon .....	32	7 1/2	22	75	240 00	264 00
	Boatman .....	34	7 1/2	24	85	258 00	282 00
	Bohemian .....	36	7 1/2	24	100	275 00	303 00
	Boland .....	40	7 1/2	25	125	312 00	340 00
	Bottomless .....	44	8	25	150	345 00	377 00
	Braddock .....	48	8	27	200	381 00	416 00
	Brawn .....	54	9	28	275	424 00	473 00
	Brockman .....	60*	10	30	400	488 00	535 00

For Cut and Description, see page 54.



## PRICE LIST

Of Cut-Off Couplings, Keyseated, ready to put on Shafts

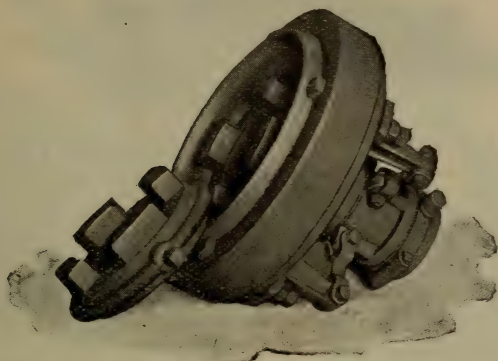
Diameter of Shaft	Size of Clutch	Capacity at 100 Rev's per min.	Space Required on Shafts		PRICE	Weight
Inches	Inches	H. P.	Inches		Dollars	Pounds
$\frac{15}{16}$	5	$1\frac{3}{4}$	$3\frac{1}{2}$	$8\frac{1}{4}$	18 00	33
$1\frac{3}{16}$	$6\frac{1}{2}$	$2\frac{1}{2}$	4	$9\frac{1}{4}$	21 00	42
$1\frac{7}{16}$	8	5	$4\frac{1}{4}$	$10\frac{1}{8}$	26 00	68
$1\frac{11}{16}$	10	7	5	$11\frac{3}{4}$	35 00	115
$1\frac{15}{16}$	12	12	6	$14\frac{1}{4}$	45 00	202
$2\frac{3}{16}$	14	18	6	17	53 00	295
$2\frac{7}{16}$	16	25	$6\frac{1}{2}$	$17\frac{1}{2}$	75 00	367
$2\frac{11}{16}$	18	34	$6\frac{1}{2}$	$18\frac{1}{4}$	95 00	479
$2\frac{15}{16}$	20	45	7	$21\frac{1}{4}$	115 00	715
$3\frac{7}{16}$	24	65	$7\frac{3}{4}$	$22\frac{1}{2}$	185 00	1010
$3\frac{15}{16}$	28	85	$8\frac{1}{8}$	$25\frac{1}{2}$	215 00	1269
$4\frac{7}{16}$	32	112	9	$28\frac{1}{2}$	285 00	1762
$4\frac{15}{16}$	42	180	$11\frac{1}{2}$	$25\frac{1}{4}$	525 00	3425
$5\frac{15}{16}$	*36	284	$11\frac{1}{2}$	$23\frac{3}{4}$	575 00	3830

\*Double Disc.

For additional charge for High Speeds Split Couplings, Etc., see Notes on preceding page

# PRICE LIST

Of Friction Clutches, Bored and Keyseated, ready to attach to Pulley or other Hub.



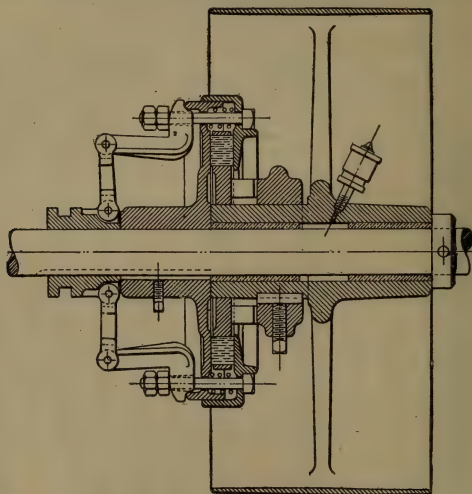
SIZE	PRICE	Outside Diameter	Space required including movm't	Largest Bore	Will drive pulley as large as		Capacity at 100 R. P. M.	WEIGHT	
					Inches				
Inches	Dollars	Inches	Inches	Inches	Diam.	Face	H. P.	Pounds	
5	12 00	7 $\frac{1}{4}$	6 $\frac{1}{4}$	1 $\frac{1}{16}$	10	3	1 $\frac{1}{2}$	22	
6	15 00	9	6 $\frac{1}{4}$	1 $\frac{1}{16}$	12	4	2 $\frac{1}{2}$	28	
8	20 00	11	6 $\frac{1}{2}$	2 $\frac{7}{16}$	18	5	5	46	
10	27 00	13	8 $\frac{1}{4}$	2 $\frac{1}{16}$	21	6	7	76	
12	36 00	15 $\frac{1}{2}$	10 $\frac{1}{4}$	3 $\frac{1}{16}$	27	8	12	142	
14	48 00	18	12 $\frac{1}{2}$	4 $\frac{7}{16}$	32	10	18	215	
16	60 00	20 $\frac{1}{4}$	13	4 $\frac{1}{16}$	35	12	25	255	
18	75 00	22 $\frac{1}{2}$	13 $\frac{1}{4}$	5 $\frac{1}{16}$	42	14	34	351	
20	95 00	25 $\frac{1}{2}$	16 $\frac{1}{4}$	5 $\frac{1}{16}$	50	16	45	544	
24	150 00	29 $\frac{1}{4}$	17	6 $\frac{7}{16}$	60	18	65	810	
28	180 00	34	19 $\frac{1}{2}$	7 $\frac{1}{16}$	66	22	85	1050	
32	230 00	39	21 $\frac{3}{4}$	7 $\frac{1}{16}$	72	24	112	1450	
36	300 00	43	23 $\frac{1}{4}$	8 $\frac{7}{16}$	78	26	142	2300	
42	500 00	49 $\frac{1}{2}$	25 $\frac{1}{4}$	9 $\frac{7}{16}$	84	30	180	2800	
48	800 00	58	26 $\frac{1}{2}$	9 $\frac{1}{16}$	96	36	240	4300	
Disc. {	36	515 00	43 $\frac{1}{2}$	23 $\frac{3}{4}$	8 $\frac{7}{16}$	108	42	284	3100
	42	700 00	50	26	9 $\frac{7}{16}$	120	48	360	4140
	48	1000 00	58	27 $\frac{1}{2}$	9 $\frac{1}{16}$	144	54	480	6000

**Notes.**—Additional charge for High Speeds as follows:  
 Over 350 revolutions per minute, 10 per cent.  
 Over 600 revolutions per minute, 15 per cent.  
 For Split Clutches, write for prices.  
 For Shifter Straps and Levers, see Price List on next page.



### PRICE LIST OF LEVER STRAPS AND END FULCRUMS.

Size	6½ in.	8 in.	10 in.	12 in.	14 in.	16 in.	18 in.
Price	.80	.90	1.00	1.25	1.75	2.25	2.75
Size	20 in.	24 in.	28 in.	32 in.	36 in.	42 in.	48 in.
Price	3.25	3.75	4.50	5.25	6.25	7.50	9.00

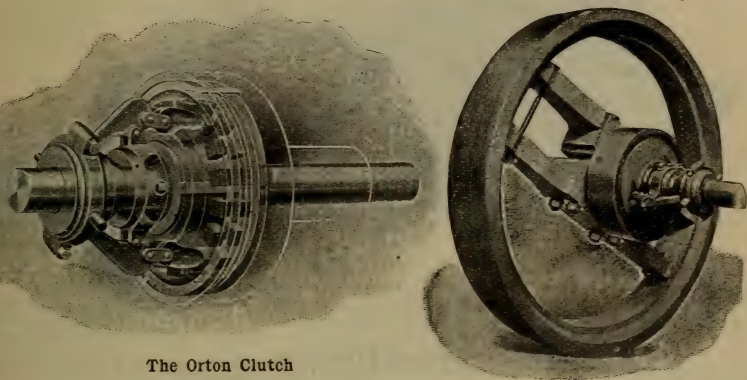


### FRICITION CLUTCH PULLEY.

PRICES QUOTED ON APPLICATION.



# The Most Efficient of Friction Clutches for Small Power and High Speed



The Orton Clutch

## Revised Dimensions and Price of the Orton Clutches

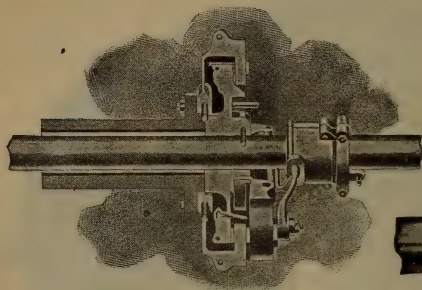
August 1, 1901.

Superseding all previous dimensions.

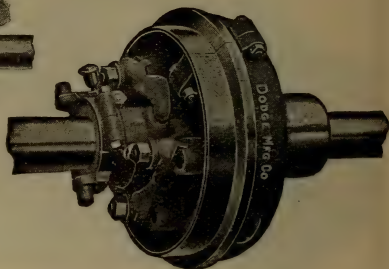
Size of Clutch	Maximum Bore in Inches		Extreme Outside Diameter Inches	H. P. at 100 R. P. M.	Will Drive Pulley as large as			Total Space on Shaft including Std. Sleeve	Std. Sleeve			Price without Pulley
	Regular	Special			Diameter	Face	Outside Diam.		Length			
							Reg.			Spcl.		
4	1¼	..	5¾	1¼	S. B. 14	D. B. ..	3	11 2/8	2 3/8	....	4½	\$15 00
5	1½	..	6½	2	16	..	4	11½	2 7/8	....	5	17 50
6	1¾	..	7 1/8	3	18	13	5	14¼	2 1/8	....	6	20 00
7	2	..	8¾	4	20	14	6	15¾	2 5/8	....	7	22 50
8	2¼	..	10¾	5	22	15	7	17¾	3 1/8	....	8	27 00
9	2½	..	11¾	6	24	16	8	20¾	3 5/8	....	10	30 00
10	3	..	12¾	10	34	24	9	21¾	4 1/8	....	11	37 00
12	3	4	15¾	15	46	32	10	23½	4½	5¾	12	45 00
14	3½	5	17¾	20	..	38	11	25¼	5	6¾	13	55 00
16	4½	6	19½	25	..	44	12	26¾	6	7½	14	75 00

The above sizes of pulleys are based upon a driving tension of 42 pounds for single belt and 60 pounds for double belt, per inch of width. When greater belt stress is used, a larger size of clutch should be employed.

## Dodge Split Friction Clutches



Clutch showing  
sleeve to receive  
pulley



Cut-off  
coupling

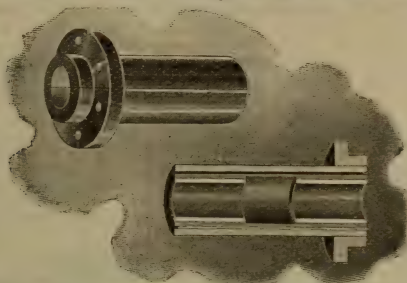
### Revised Price List

Size of Clutch	Largest Size Clutch will Bore, inches	Extreme Outside Diameter inches	H.P. at 100 Revs.	Will drive Pulley as large as		Price Mechanism Complete	Size of Shaft equal to capacity of Clutch, in Inches	Price of Coupling Complete
				Diam. in.	Face in.			
10	2½	12	6	26	7	\$ 38.50	1½	\$ 49.00
12	3	16½	10	30	10	45.50	1¾	56.00
14	3½	18¾	15	36	12	54.50	2	66.00
16	4½	20½	19	40	14	70.00	2½	82.00
18	5	22¾	26	48	16	90.00	2½	102.00
20	6	24¾	34	52	18	110.00	2¾	124.00
22	6	27	42	60	18	135.00	3	150.00
24	6½	29¼	51	64	20	155.00	3¼	172.00
26	6½	31½	63	72	22	170.00	3½	190.00
28	7	32½	78	84	24	190.00	3¾	213.00
30	7½	33	90	86	24	238.00	4	264.00
36	8	40¼	126	102	26	310.00	4½	339.00
40	10	45½	150	108	30	350.00	4¾	382.00
42	10	47¼	162	114	30	380.00	...	.....
48	12	54	210	114	36	455.00	5	495.00
54	12	60½	295	120	42	575.00	6	641.00
60	12	67¾	400	144	44	720.00	6½	810.00

The above price list includes shifter yoke and fulcrum casting.

Extended sleeves extra. See price list for standard sleeves next page.

## Extension Sleeves for Dodge Split Friction Clutches



Adapted for Pulleys, Rope Sheaves, Gears, Sprockets, Drums, Etc.

This list is for finished split iron sleeves, lined with best genuine metal, accurately bored, fitted to clutch mechanism and keyseated, ready to receive clutch connection. Each sleeve is fitted for one or more compression grease cups, according to length, size of shaft and speed. Patented May 30, 1893.

### Price List for Clutches 30 Inches in Diameter and Less

Length of Sleeve in Inches	Size of Shaft in Inches								
	2" & less	2¼ to 2½"	2¾ to 3"	3¼ to 3½"	3¾ to 4"	4¼ to 4½"	4¾ to 5"	5¼ to 5½"	5¾ to 6"
4.....	\$ 4.95	\$ 6.08							
5.....	5.60	6.84	\$ 8.10						
6.....	6.30	7.60	8.90	\$10.22	\$12.60				
7.....	6.95	8.40	9.70	11.14	13.60				
8.....	7.60	9.15	10.50	12.06	14.60	\$16.70			
9.....	8.25	9.90	11.30	12.98	15.60	17.80	\$20.35	\$25.25	\$30.15
10.....	8.90	10.65	12.10	13.90	16.60	18.90	21.60	26.70	31.80
11.....	9.60	11.40	13.00	14.80	17.60	20.00	22.85	28.15	33.45
12.....	10.25	12.20	13.80	15.75	18.60	21.10	24.10	29.60	35.10
13.....	10.90	13.00	14.60	16.70	19.60	22.20	25.35	31.05	36.70
14.....	11.55	13.70	15.40	17.60	20.60	23.30	26.60	32.50	38.40
15.....	12.25	14.50	16.20	18.50	21.60	24.40	27.85	33.95	40.05
16.....	12.90	15.20	17.00	19.45	22.60	25.50	29.10	35.40	41.70
18.....		16.00	17.80	20.35	23.60	26.60	30.35	36.85	43.35
20.....			18.60	21.30	24.60	27.70	31.60	38.30	46.65
22.....			19.40	22.20	25.60	28.80	32.85	39.75	48.30
24.....			20.20	23.12	26.60	29.90	34.10	41.20	49.95
26.....			21.00	24.05	27.60	31.00	35.35	42.65	51.60
28.....			21.80	24.97	28.60	32.10	36.60	44.10	53.25
Additional Sleeve lgths per inch	.35	.40	.40	.45	.50	.55	.65	.75	.85

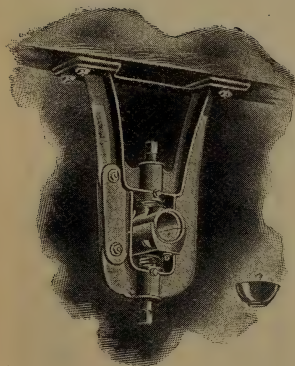
For clutches over 30 inches in diameter, add 15 per cent. to above list.

## Price List with Standard Bearings

**"Dodge"**  
Adjustable Ball  
and Socket Drop  
Hangers

Single or  
Double Braced

Size of Shaft	Brace	Drop in Inches							
		8	10	12	14	16	18	20	24
1 <sup>3</sup> / <sub>8</sub>	Sgl	\$3.65	\$3.80	\$4.00	\$4.25	\$4.35	\$4.75	\$5.20	.....
	Dbl	3.95	4.10	4.30	4.55	4.65	5.05	5.50	.....
1 <sup>1</sup> / <sub>2</sub>	Sgl	4.55	4.70	4.90	5.15	5.25	5.65	6.10	.....
	Dbl	4.95	5.10	5.30	5.55	5.65	6.05	6.50	.....
1 <sup>1</sup> / <sub>4</sub>	Sgl	4.65	4.80	5.00	5.25	5.35	5.75	6.20	.....
	Dbl	5.05	5.20	5.40	5.65	5.75	6.15	6.60	.....
1 <sup>1</sup> / <sub>8</sub>	Sgl	6.35	6.85	7.00	7.30	7.75	8.30	8.80	\$9.15
	Dbl	6.85	7.35	7.50	7.80	8.25	8.30	8.80	9.65
2 <sup>3</sup> / <sub>16</sub>	Sgl	8.15	8.50	8.65	9.15	9.75	10.20	11.10	12.80
	Dbl	8.70	9.05	9.20	9.70	10.30	10.75	11.65	13.35
2 <sup>1</sup> / <sub>2</sub>	Sgl	8.80	9.10	9.30	9.80	10.40	10.85	11.75	13.45
	Dbl	9.35	9.65	9.85	10.35	10.95	11.40	12.30	14.00
2 <sup>1</sup> / <sub>4</sub>	Sgl	10.05	10.55	11.15	11.25	12.55	13.65	14.70	16.95
	Dbl	10.85	11.35	11.95	12.05	13.35	14.45	15.50	17.75
2 <sup>1</sup> / <sub>8</sub>	Sgl	12.00	12.50	13.10	13.20	14.50	15.60	16.65	18.90
	Dbl	12.80	13.30	13.90	14.00	15.30	16.40	17.45	19.70
3 <sup>3</sup> / <sub>8</sub>	Sgl	.....	.....	15.90	16.65	17.15	18.55	20.45	23.65
	Dbl	.....	.....	16.95	17.70	18.20	19.60	21.50	24.70
3 <sup>1</sup> / <sub>2</sub>	Sgl	.....	.....	16.35	17.10	17.60	19.00	20.90	24.10
	Dbl	.....	.....	17.40	18.15	18.65	20.05	21.95	25.15



Capillary Oiling  
Bearings

Bearings Machine Reamed  
and Faced.

## Price List with Capillary Oiling Bearings

Size of Shaft	Brace	Drop in Inches							
		8	10	12	14	16	18	20	24
1 <sup>3</sup> / <sub>8</sub>	Sgl	4.65	4.80	5.00	5.25	5.35	5.75	6.20	.....
	Dbl	4.95	5.10	5.30	5.55	5.65	6.05	6.50	.....
1 <sup>1</sup> / <sub>2</sub>	Sgl	5.35	5.50	5.70	5.95	6.05	6.45	6.90	.....
	Dbl	5.65	5.90	6.10	6.35	6.45	6.85	7.30	.....
1 <sup>1</sup> / <sub>4</sub>	Sgl	5.60	5.75	5.95	6.20	6.30	6.70	7.15	.....
	Dbl	6.00	6.15	6.35	6.60	6.70	7.10	7.55	.....
1 <sup>1</sup> / <sub>8</sub>	Sgl	8.25	8.75	8.90	9.20	9.65	9.70	10.20	11.05
	Dbl	8.75	9.25	9.40	9.70	10.15	10.20	10.70	11.55
2 <sup>3</sup> / <sub>16</sub>	Sgl	10.15	10.50	10.65	11.15	11.75	12.20	13.10	14.80
	Dbl	10.70	11.05	11.20	11.70	12.30	12.75	13.65	15.35
2 <sup>1</sup> / <sub>2</sub>	Sgl	10.75	11.10	11.25	11.75	12.35	12.80	13.70	15.40
	Dbl	11.30	11.65	11.80	12.30	12.90	13.35	14.25	15.95
2 <sup>1</sup> / <sub>4</sub>	Sgl	12.65	13.25	13.75	13.85	15.15	16.25	17.30	19.55
	Dbl	13.45	14.05	14.55	14.65	15.95	17.05	18.10	20.35
2 <sup>1</sup> / <sub>8</sub>	Sgl	15.40	15.90	16.50	16.60	17.90	19.00	20.05	22.30
	Dbl	16.20	16.70	17.30	17.40	18.70	19.80	20.85	23.10
3 <sup>3</sup> / <sub>8</sub>	Sgl	.....	.....	24.20	24.95	25.45	26.85	28.75	31.95
	Dbl	.....	.....	25.25	26.00	26.50	27.90	29.80	33.00
3 <sup>1</sup> / <sub>2</sub>	Sgl	.....	.....	26.55	27.30	27.80	29.20	31.10	34.30
	Dbl	.....	.....	27.60	28.35	28.85	30.25	32.15	35.35



## DOUBLE BRACE DROP HANGERS AND FLOOR STANDS.

All our Double Brace Drop Hangers are properly proportioned to carry the strain of the various shafts for which they are designed.

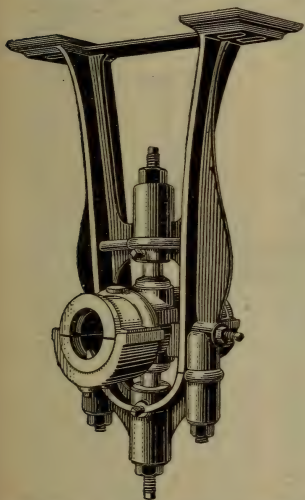
We make four (4) styles :

Ring-Oiling Ball and Socket Hangers.	} As below described.
" " Screw Hangers.	
Wick-Oiling Ball and Socket Hangers.	
" " Screw Hangers.	

### Ring-Oiling Double Brace Ball and Socket Drop Hangers.

**BABBITTED BEARINGS.**  
FOR PRICE LIST SEE PAGE 66.

These hangers have bearings equal to four (4) diameters of the shaft, and are true Ball and Socket, the radius of the ball being struck from the center of the shaft, which is not the case in many other makes. They are supplied with ring-oiling device, which consists of rings which pass around the shaft and down into the reservoir. These rings revolve with the shaft, and continually convey a generous amount of oil to the bearings. The reservoir is large, and holds a good supply of oil. The boxes are held in place by plungers, which form the socket, and are faced off at the ends. These are oil saving bearings, the boxes being furnished with a wiper which wipes the oil from the shaft at the ends of the bearings, causing it to return to the reservoir from whence it is again used. There is a plug in the bottom of the reservoir, which can be removed should it be necessary to drain out the oil. Lateral adjustment is secured by means of slotted holes in the base of hangers.



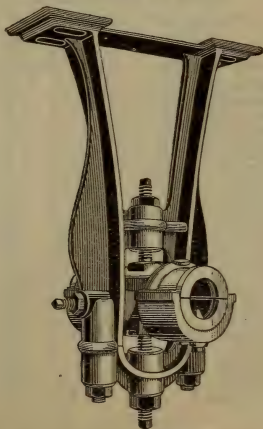
**OUT No. 53. RING-OILING DOUBLE BRACE BALL AND SOCKET DROP HANGERS.**

### Ring-Oiling Double Brace Screw Drop Hangers.

**BABBITTED BEARINGS.**  
FOR PRICE LIST SEE PAGE 66.

These hangers are similar to the Ring-Oiling Ball and Socket Hangers, except as to the adjustments.

They have all the movements of the Ball and Socket, and, in addition, are made with lateral adjusting screws in the sides of the boxes, by which the shaft can be accurately lined up.



**OUT No. 54. RING-OILING DOUBLE BRACE SCREW DROP HANGERS.**

# RING-OILING DOUBLE BRACE DROP HANGERS AND FLOOR STANDS.

BALL AND SOCKET, (Per Cut No. 53.)

SCREW HANGER, (Per Cut No. 54.)

Adjustable in All Directions, Babbitted Bearings.

DESCRIPTION PAGE 65.

Diameter of Shaft.....	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16
Length of Bearing.....	6	7	8	9	10	11	12	13
Length over all.....	8½	9½	10	11½	12½	13½	14½	15½
Diameter of Shaft.....	37/16	311/16	315/16	43/16	47/16	411/16	415/16	
Length of Bearing.....	14	15	16	17	18	19	20	
Length over all.....	16½	17½	19	20	20½	22	23½	

Length of bearings can not be changed.



SCREW HANGER



BALL AND SOCKET.

SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Anility.....	\$7 00	1 7/16	10	\$3 40	Aonian.
Animated.....	7 25		11	8 00	Aorist.
Animose.....	7 50		12	8 80	Apac.
Anise.....	7 75		13	9 00	Apanage.
Annals.....	8 00		14	9 25	Apatelite.
Annal.....	8 25	1 11/16	15	9 50	Apathetic.
Annodon.....	7 70		16	9 20	Apathist.
Annolis.....	7 95		17	9 40	Apathy.
Annuity.....	8 20		18	9 60	Apepsy.
Annular.....	8 45		19	9 80	Apercu.
Anode.....	8 70	1 15/16	20	10 00	Aperient.
Anoint.....	8 95		21	10 20	Apert.
Anointer.....	9 20		22	10 50	Apertion.
Anomaly.....	9 45		23	10 80	Aperture.
Anomite.....	8 70		24	10 20	Aphanite.
Anomy.....	8 95		25	10 40	Aphelion.
Ansated.....	9 20		26	10 60	Aphony.
Anteater.....	9 45		27	10 80	Aphorism.
Antalgic.....	9 70		28	11 00	Aphong.
Anteact.....	9 95		29	11 20	Apiarist.
Antecede.....	10 20		30	11 50	Apiary.
Antedate.....	10 50			11 80	Apish.
Antenna.....	12 00			13 60	Aplatir.
Antepone.....	13 60			15 00	Aplomb.

We are prepared to furnish 25-inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.

SCREW HANGERS.		Diameter of Shaft	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Anterior.....	\$10 00	2 3/16	10	\$11 60	Apodal.
Anteroom.....	10 30		12	11 90	Apograph.
Anteverl.....	10 60		14	12 20	Apologist.
Anthill.....	10 90		16	12 50	Apologue.
Anticar.....	11 20		18	12 80	Apoplexy.
Antilogy.....	11 50		20	13 20	Aporia.
Antler.....	12 00		22	13 60	Apostasy.
Antiphon.....	12 50		24	14 00	Apostate.
Antiquate.....	14 00		27	15 80	Apostolic.
Antitype.....	15 50		30	17 00	Apotome.
Apozem.....	11 40	2 7/16	10	13 30	Arduity.
Appanage.....	11 75		12	13 60	Arduo.
Apparel.....	12 10		14	13 90	Areca.
Apparent.....	12 45		16	14 20	Arefy.
Appeach.....	12 80		18	14 50	Areole.
Appeaser.....	13 20		20	14 90	Areotic.
Appellate.....	13 60		22	15 30	Argosy.
Append.....	14 00		24	15 70	Arguable.
Appendix.....	16 00		27	18 00	Argument.
Appenine.....	17 00		30	19 00	Arid.
Applause.....	18 00	2 11/16	36	20 20	Aridity.
Apprizer.....	12 80		10	14 90	Arisen.
Approach.....	13 15		12	15 20	Armbone.
Approof.....	13 50		14	15 50	Armchair.
Appuyer.....	13 90		16	15 80	Armful.
Apras.....	14 30		18	16 10	Armhole.
Apricity.....	14 70		20	16 50	Armistice.
Apricot.....	15 10		22	16 90	Armorer.
Aproned.....	15 50		24	17 30	Armpit.
Aprposed.....	18 00		27	20 00	Aromatic.
Aptable.....	19 10	2 15/16	30	21 50	Arraign.
Aptate.....	20 30		36	23 00	Arrant.
Aptitude.....	14 20		10	16 50	Arrayed.
Aptly.....	14 60		12	16 80	Arrears.
Aqueduct.....	15 00		14	17 10	Arriner.
Aqueous.....	15 40		16	17 40	Arrogance.
Aquiline.....	15 80		18	17 70	Arroundir.
Aquosity.....	16 20		20	18 00	Arrosage.
Arabical.....	16 60		22	18 40	Arrosion.
Arabiam.....	17 00		24	18 80	Arsenal.
Arable.....	20 00	3 5/16	27	22 00	Arterial.
Arbalist.....	20 90		30	23 50	Artful.
Arborist.....	22 80		36	25 00	Artfully.
Arcadian.....	17 10		10	20 50	Article.
Arcduke.....	17 70		12	20 90	Artifice.
Archives.....	15 40		14	21 30	Artillize.
Archness.....	19 10		16	21 70	Artillery.
Archway.....	19 80		18	22 10	Artless.
Archwise.....	20 50		20	22 50	Ascetic.
Ardency.....	22 20		22	23 00	Ashamed.
Ardoise.....	22 90	3 7/16	24	23 50	Ashantee.
Ashler.....	23 60		27	26 00	Audible.
Ashpit.....	24 90		30	27 20	Auditory.
Ashpole.....	26 30		36	28 50	Augment.
Ashsub.....	22 30		10	25 00	Aurist.
Askance.....	22 80		12	25 50	Auspice.
Aslant.....	23 30		14	26 00	Austral.
Asperity.....	23 80		16	26 60	Autopsy.
Aspirate.....	24 40		18	27 20	Autotyp.
Assassin.....	25 00		20	27 80	Avaler.
Assembly.....	25 60		22	28 40	Avant.

We are prepared to furnish 25 inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.

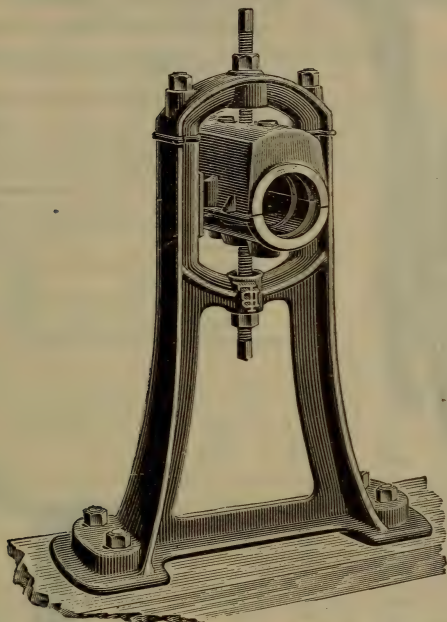
SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Assertion.....	\$26 20	3 7/16	24	\$29 00	Avarice.
Assessed.....	27 50		27	30 00	Avenger.
Assize.....	28 40		30	31 20	Averment.
Assoler.....	29 40		36	32 50	Aversive.
Assume.....	25 00	3 11/16	12	28 00	Avertir.
Asternal.....	25 75		14	28 75	Aviary.
Astray.....	26 50		16	29 50	Avidity.
Astride.....	27 25		18	30 25	Avouch.
Astrut.....	28 00		20	31 00	Avowing.
Astute.....	28 75		22	31 75	Awaking.
Asunder.....	29 50		24	32 50	Awry.
Asylum.....	30 30		27	34 00	Axehead.
Atabal.....	31 40		30	35 00	Axle.
Atelier.....	32 50		36	36 00	Babe.
Atellan.....	27 50	3 15/16	12	30 50	Babose.
Atheism.....	28 25		14	31 10	Baboon.
Atheous.....	29 00		16	32 10	Babyism.
Atherine.....	29 75		18	32 90	Babyhood.
Athirst.....	30 50		20	33 70	Backbite.
Athlete.....	31 40		22	34 00	Backward.
Atoms.....	32 30		24	35 50	Badinage.
Atoning.....	33 20		27	36 50	Bagman.
Atrocity.....	34 20		30	37 50	Bagpipe.
Atrophy.....	35 20		36	38 50	Bagner.
Atteler.....	30 50	4 3/16	14	33 00	Bailment.
Atterate.....	31 30		16	34 50	Balanc.
Attestive.....	32 10		18	35 40	Baldness.
Attical.....	33 00		20	36 30	Baleful.
Attitude.....	33 80		22	37 20	Balk.
Atypic.....	34 80		24	38 20	Ballad.
Auberge.....	35 70		27	39 20	Balourd.
Bambin.....	36 80		30	40 30	Batonic.
Baneful.....	38 00		36	41 50	Battish.
Banish.....	33 00	4 7/16	14	36 00	Bavard.
Banquet.....	33 80		16	37 00	Bavolet.
Bantam.....	34 00		18	38 00	Baying.
Baptism.....	35 50		20	39 00	Beadroll.
Barb.....	36 40		22	40 00	Beaker.
Barbated.....	37 30		24	41 00	Beaming.
Barbecue.....	38 30		27	42 00	Beamless.
Barbotes.....	39 60		30	43 00	Bearable.
Barbism.....	41 00		36	44 50	Bearer.
Rarely.....	36 00	4 11/16	14	39 00	Bearish.
Bareness.....	37 00		16	40 00	Beaten.
Barking.....	38 00		18	41 00	Beatify.
Barmaid.....	39 00		20	42 00	Beaufils.
Barrier.....	40 00		22	43 00	Beckon.
Barrulet.....	41 00		24	44 00	Becloud.
Bartery.....	42 50		27	45 00	Bedaub.
Bascule.....	44 00		30	47 50	Bedding.
Basement.....	45 50		36	49 00	Bedew.
Baseness.....	39 00	4 15/16	14	43 00	Bedmate.
Basilisk.....	40 10		16	44 00	Bedote.
Basinet.....	41 30		18	45 00	Bedrid.
Basking.....	42 50		20	46 00	Bedside.
Bassock.....	43 70		22	47 00	Beechen.
Batable.....	45 00		24	48 00	Beefsteak.
Batelage.....	46 50		27	50 00	Beehive.
Bateless.....	48 70		30	52 00	Beemoth.
Bateful.....	51 00		36	54 50	Beelle.

We are prepared to furnish 25-inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.



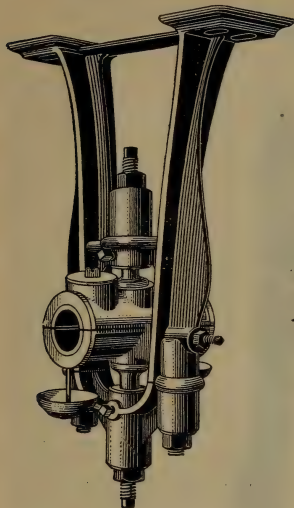
## HANGERS



**DOUBLE-BRACED ADJUSTABLE HANGERS.  
SELF-OILING-NON-DRIPPING.**

Drop in Inches.		7	10	13	16	19	22	25	30	36	Length of Boxes
Diameter of Shaft.	15-16	\$ 3 85	\$ 4 40	\$ 5 90	\$ 6 40	\$ 7 20	\$ 7 30				61 $\frac{1}{2}$
	1 3-16	4 60	5 15	6 25	6 70	7 40	7 50				71 $\frac{3}{8}$
	1 7-16	5 40	5 95	7 00	7 50	8 05	8 30				81 $\frac{3}{8}$
	1 11-16	6 25	6 70	7 80	8 30	8 75	9 00				9
	1 15-16	8 35	9 10	9 90	10 70	11 45	12 25	\$13 00	\$14 05		95 $\frac{5}{8}$
	2 3-16	10 15	11 20	12 20	12 95	13 80	15 00	16 10	17 10		101 $\frac{1}{2}$
	2 7-16	12 65	13 45	14 40	15 62	16 80	18 10	19 30	21 40	\$24 70	111 $\frac{3}{8}$
	2 11-16	15 80	16 55	18 40	19 20	20 30	21 95	24 20	27 30	32 65	121 $\frac{1}{2}$
	2 15-16	18 70	20 10	21 65	23 10	24 20	26 15	28 10	31 55	36 95	129 $\frac{1}{4}$
	3 3-16	20 40	23 75	25 45	26 90	28 10	30 40	32 35	35 90	41 40	131 $\frac{1}{2}$
	3 7-16		30 40	32 75	34 70	36 25	39 00	41 35	45 25	51 50	141 $\frac{1}{2}$
	3 15-16		37 45	39 80	41 45	43 30	46 00	49 15	51 50	57 00	155 $\frac{1}{4}$
4 7-16		50 70	51 48	52 62	54 60	56 95	60 05	63 95	70 95	17	
4 15-16		56 15	58 50	61 20	64 75	69 40	75 65	82 70	106 00	203 $\frac{1}{4}$	

**ORDERS PROMPTLY FILLED FROM LARGE STOCKS.**



**CUT NO. 55. WICK-OILING DOUBLE  
BRACE BALL AND SOCKET  
DROP HANGERS.**

## **Wick-Oiling Double Brace Ball and Socket Drop Hangers.**

### **BABBITTED BEARINGS.**

FOR PRICE LIST SEE PAGE 71.

These hangers are true Ball and Socket, the radius of the ball being struck from the center of the shaft, which is not the case in many other makes.

These are self-oiling, the oil being conveyed to the shaft by wicking which passes from the reservoir along the shaft, thus feeding the oil the entire length of the bearing.

The supply of oil can be governed by the number of strands of wicking.

The boxes are faced off at the ends.

Lateral adjustment is secured by means of the slotted holes in the base of hanger.

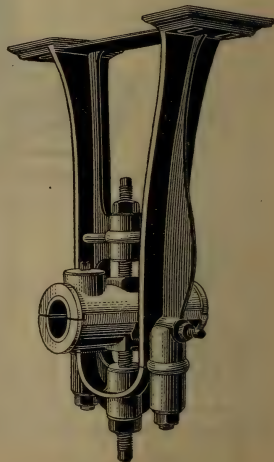
## **Wick-Oiling Double Brace Screw Drop Hangers.**

### **BABBITTED BEARINGS.**

FOR PRICE LIST SEE PAGE 71.

These hangers are similar to the Wick-Oiling Ball and Socket Hangers, except as to the adjustments.

They have all the movements of the ball and socket, and, in addition, are supplied with lateral adjusting screws in the sides of the boxes, by which the shaft can be accurately lined up.



**CUT NO. 56. WICK-OILING DOUBLE  
BRACE SCREW DROP HANGERS.**

# WICK-OILING DOUBLE BRACE DROP HANGERS AND FLOOR STANDS.

BALL AND SOCKET, (Per Cut 55.)

SCREW HANGER, (Per Cut 56.)

Adjustable in All Directions, Self-Oiling, Babbitted Bearings.

DESCRIPTION ON PAGE 70.

Diameter of Shaft.....	17/16	11 1/16	1 5/16	23/16	27/16	2 11/16	2 5/16	33/16
Length of Bearing.....	6	7	8	9	10	11	12	12
Diameter of Shaft.....	37/16	3 11/16	3 5/16	43/16	47/16	4 11/16	4 5/16	.....
Length of Bearing.....	12 1/2	13	14	14 1/2	15	15 1/2	16	.....

For longer Bearings see Page 63.



SCREW HANGER.



BALL AND SOCKET.

SCREW HANGERS.		Diameter. of Shaft.	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Accolade.....	\$5. 15	1 7/16	10	\$6. 50	Acreege.
Accolent.....	5 40		12	6 70	Acrebite.
Accorder.....	5 05		14	6 95	Acrid.
Accosted.....	5 90		16	7 20	Acridity.
Accosting.....	6 15		18	7 45	Acrimony.
Accounter.....	6 40		20	7 70	Acritude.
Actouple.....	5 50	1 11/16	10	7 00	Acrogen.
Accoutre.....	5 75		12	7 20	Actingly.
Accretion.....	6 00		14	7 45	Actively.
Accroach.....	6 25		16	7 70	Actuary.
Accumb.....	6 50		18	7 95	Actuate.
Accuracy.....	6 75	1 15/16	20	8 20	Aculeate.
Accurodic.....	7 05		22	8 45	Aculeous.
Accursed.....	7 35		24	8 70	Acumen.
Accusable.....	6 10		10	7 50	Adacted.
Accusers.....	6 30		12	7 70	Adafina.
Accusing.....	6 50	2 3/16	14	7 95	Adalia.
Accustom.....	6 70		16	8 20	Adamite.
Acedura.....	6 90		18	8 45	Adapter.
Acerola.....	7 10		20	8 70	Adatis.
Acervate.....	7 50		22	8 95	Addeem.
Acetify.....	7 90	2 7/16	24	9 20	Adible.
Acetase.....	9 40		27	10 70	Additive.
Aching.....	10 90		30	12 30	Addle.
Acicalar.....	7 20		10	8 50	Adduce.
Acidness.....	7 45		12	8 75	Adducent.
Acology.....	7 70	2 11/16	14	9 00	Adequate.
Acolyte.....	7 95		16	9 30	Adherence.

We are prepared to furnish 25-inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.

SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Aconite.....	\$8 20	2 3/16	18	\$9 60	Adhesion.
Acopar.....	8 50		20	9 90	Adieu.
Acquest.....	8 90		22	10 20	Adipous.
Acquirer.....	9 30		24	10 50	Adject.
Acquist.....	11 10		27	12 20	Adjudge.
Acrazy.....	13 00		30	14 00	Adjure.
Adjusted.....	8 30	2 7/16	10	10 10	Affright.
Adjutant.....	8 60		12	10 40	Affuse.
Admired.....	8 95		14	10 70	Affusion.
Admitter.....	9 30		16	11 00	Afresh.
Admix.....	9 65		18	11 40	Aftolar.
Adnate.....	10 00		20	11 80	Agalaxy.
Adoptive.....	10 40		22	12 20	Agalma.
Adorable.....	10 80		24	12 60	Agamist.
Adoreth.....	13 00		27	14 00	Agape.
Adorning.....	14 00		30	15 40	Agarenb.
Adragant.....	15 10		36	17 00	Agatize.
Adratat.....	9 40	2 11/16	10	11 50	Aggerosa.
Adulthood.....	9 80		12	11 80	Aggrace.
Aduncity.....	10 20		14	12 10	Aggress.
Adustion.....	10 60		16	12 40	Aggrieve.
Advenir.....	11 00		18	12 80	Aggroup.
Advent.....	11 50		20	13 20	Aghast.
Advertent.....	12 00		22	13 60	Agility.
Advisary.....	12 50		24	14 00	Agister.
Advocacy.....	14 50		27	15 80	Agistant.
Adze.....	15 80		30	17 60	Agitation.
Aeration.....	17 10		36	19 50	Aglet.
Aerolite.....	10 50	2 15/16	10	13 00	Agnail.
Aerology.....	11 00		12	13 30	Agneler.
Aeronaut.....	11 50		14	13 60	Agonism.
Affadir.....	12 00		16	13 90	Agonize.
Affame.....	12 50		18	14 30	Agramut.
Affear.....	13 00		20	14 70	Agrestic.
Affected.....	13 60		22	15 10	Agrostia.
Affection.....	14 50		24	15 50	Aguish.
Afferent.....	16 00		27	17 50	Aidance.
Affiance.....	17 50		30	19 50	Aidless.
Affied.....	19 10		36	21 50	Aignan.
Affiliate.....	13 40	3 3/16	10	16 00	Aigulet.
Affinity.....	13 90		12	16 40	Aileron.
Afflict.....	14 40		14	16 80	Ailment.
Affluence.....	14 90		16	17 20	Airball.
Afflux.....	15 40		18	17 60	Aircell.
Affoler.....	15 90		20	18 00	Airgun.
Afforded.....	16 60		22	18 50	Airholes.
Affray.....	17 50		24	19 00	Airling.
Ajutage.....	19 00		27	20 60	Aliment.
Akimbo.....	20 50		30	22 20	Aliped.
Alabaster.....	22 10		36	23 80	Aliquant.
Alabuga.....	16 80	3 7/16	10	20 00	Alitute.
Alacrity.....	17 35		12	20 50	Alkahesb
Aladag.....	17 90		14	21 00	Alkaloid.
Alagate.....	18 45		16	21 50	Alkanet.
Alantane.....	19 05		18	22 00	Allanite.
Alarment.....	19 65		20	22 60	Allatrate.
Alarming.....	20 25		22	23 20	Allective.
Alarmist.....	20 85		24	23 80	Allegretto.
Alava.....	22 00		27	24 80	Allemand.
Albacete.....	23 40		30	25 80	Allocation.
Albeuve.....	24 90		36	26 90	Allodial.

We are prepared to furnish 25-inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

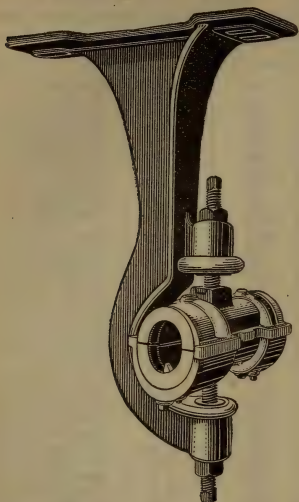
Can furnish Hangers for all intermediate sizes of shaft, at prices of nearest size listed.



SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.		
Cipher.	Price.		Drop.	Price.	Cipher.
Albicore.....	\$18 50	3 11/16	12	\$22 00	Allonge.
Alborace.....	19 25		14	22 60	Alloquy.
Albugine.....	20 00		16	23 20	Allotted.
Alcahest.....	20 75		18	23 90	Allotment.
Alcala.....	21 50		20	24 60	Allowance
Alchamy.....	22 25		22	25 30	Allumette.
Aldego.....	23 00		24	26 00	Alluvial.
Aldern.....	24 50		27	27 00	Almady.
Aleberry.....	25 50		30	28 00	Almagest.
Alecost.....	26 50		36	29 00	Almagra.
Aleconner.....	19 80	3 15/16	12	24 00	Almendra.
Alegrana.....	20 70		14	24 70	Almery.
Alembic.....	21 60		16	25 40	Alloetical.
Alenois.....	22 50		18	26 10	Alogy.
Alesage.....	23 40		20	26 80	Aloof.
Alfet.....	24 30		22	27 70	Alopecy.
Algalie.....	25 20		24	28 50	Alpestre.
Alganon.....	26 70		27	29 50	Alphenic.
Algates.....	27 50		30	30 50	Alterant.
Algid.....	28 50		36	31 50	Altercate.
Algidity.....	23 40	4 3/16	14	27 00	Alterity.
Algific.....	24 30		16	28 00	Altitude.
Algorism.....	25 25		18	29 00	Aludel.
Alidade.....	26 20		20	30 00	Alveary.
Alienate.....	27 15		22	31 00	Alveated.
Aliform.....	28 10		24	32 00	Alveolar.
Alight.....	29 50		27	33 00	Amadine.
Amative.....	30 45		30	34 00	Amputate.
Amatory.....	31 40		36	35 00	Amuck.
Amazedly.....	26 00	4 7/16	14	29 50	Amulet.
Amazing.....	27 00		16	30 50	Amusable.
Ambages.....	28 00		18	31 50	Amusing.
Ambient.....	29 00		20	32 50	Amyline.
Ambiguity.....	30 00		22	33 50	Anacarde.
Ambition.....	31 00		24	34 50	Anagalis.
Ambitude.....	32 00		27	35 50	Anagogy.
Ambulant.....	33 00		30	36 50	Analeme.
Amenable.....	34 00		36	37 50	Analogy.
Amenance.....	28 30	4 11/16	14	32 00	Analysis.
Amending.....	29 35		16	33 00	Analyze.
Amenity.....	30 40		18	34 00	Anapest.
Amentum.....	31 50		20	35 00	Anaphora.
Amorse.....	32 60		22	36 00	Ancestor.
Amicable.....	33 70		24	37 00	Ancestral.
Amid.....	35 00		27	38 50	Anchorite.
Amidst.....	36 40		30	40 00	Anchovy.
Amnesty.....	37 80		36	41 50	Ancolic.
Amodier.....	31 00	4 15/16	14	35 00	Andante.
Amollir.....	32 15		16	36 00	Androjd.
Amoret.....	33 30		18	37 00	Anemone.
Amorous.....	34 50		20	38 00	Anent.
Amorphe.....	35 70		22	39 00	Angelic.
Amortise.....	36 90		24	40 00	Angelot.
Ample.....	38 40		27	41 30	Anglais.
Ampliate.....	40 00		30	43 60	Anglers.
Amplifier.....	41 60		36	45 50	Anglican.

We are prepared to furnish 25-inch, 28-inch, 31-inch and 37-inch drop, and all intermediate drops from 6 inches to 24 inches.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.



**CUT NO. 51. RING-OILING SINGLE BRACE  
DROP HANGER AND FLOOR STANDS.**

## **Ring-Oiling Single Brace Drop Hangers and Floor Stands.**

### **BABBITTED BEARINGS.**

**FOR PRICE LIST SEE PAGE 75.**

These hangers are similar in design to our Single Brace Wick-Oiling, except that the box is provided with ring-oiling device.

This box is fully described under the head of Double Brace Ring-Oiling Hangers.

## **Wick-Oiling Single Brace Drop Hangers and Floor Stands.**

### **BABBITTED BEARINGS.**

**FOR PRICE LIST SEE PAGE 75.**

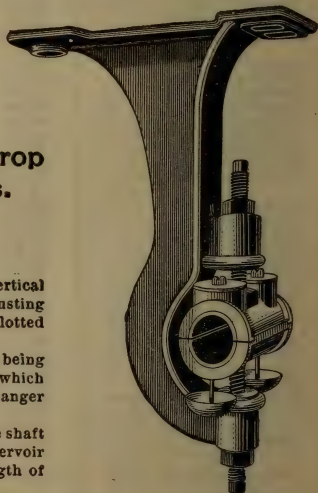
These hangers are adjustable in all directions, vertical adjustment being obtained by means of the adjusting screws, and lateral adjustment by means of the slotted holes in the base of the hanger.

These hangers possess a very valuable feature in being provided with an elongated recess in the box, by which the bearing adjusts itself to the shaft when the hanger does not come perpendicular to the shaft.

They are self-oiling, the oil being conveyed to the shaft by means of wicking, which passes from the reservoir along the shaft, thus feeding the oil the entire length of the bearing.

The supply of oil can be governed by the number of strands of wicking.

The boxes are faced off at the ends.



**CUT NO. 52. WICK-OILING SINGLE  
BRACE DROP HANGERS  
AND FLOOR STANDS.**

# SINGLE BRACE DROP HANGERS AND FLOOR STANDS.

RING OILING, (PER CUT No. 51.)

WICK OILING, (PER CUT No. 52.)

Adjustable in All Directions, Self-Oiling Babbitted Bearings.

DESCRIPTION ON PAGE 74.

## WICK OILING.

Diameter of Shaft.....	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
Length of Bearing.....	5	6	7	8	9	10
Diameter of Shaft.....	$2\frac{11}{16}$	$2\frac{15}{16}$	$3\frac{3}{16}$	$3\frac{7}{16}$	$3\frac{11}{16}$	$3\frac{15}{16}$
Length of Bearing.....	11	12	12	12½	13	14

For longer bearings see page 54

## RING OILING.

Diameter of Shaft.....	$1\frac{3}{16}$	$1\frac{7}{16}$	$1\frac{11}{16}$	$1\frac{15}{16}$	$2\frac{3}{16}$	$2\frac{7}{16}$
Length of Bearing.....	6	6	7	8	9	10
Length over all.....	$8\frac{3}{4}$	$8\frac{3}{4}$	$9\frac{3}{4}$	10	$11\frac{3}{4}$	$12\frac{3}{4}$
Diameter of Shaft.....	$2\frac{11}{16}$	$2\frac{15}{16}$	$3\frac{3}{16}$	$3\frac{7}{16}$	$3\frac{11}{16}$	$3\frac{15}{16}$
Length of Bearing.....	11	12	13	14	15	16
Length over all.....	$13\frac{3}{4}$	$14\frac{3}{4}$	$15\frac{3}{4}$	$16\frac{3}{4}$	$17\frac{3}{4}$	19

Length of bearing of Ring Oilers can not be changed.



WICK OILING.



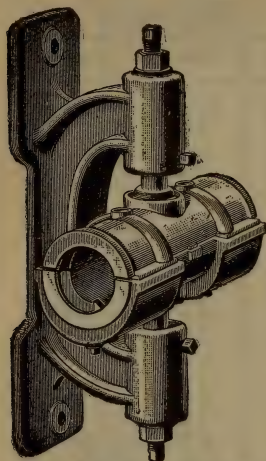
RING OILING.

WICK OILING.		Diameter of Shaft.	RING OILING.		
Cipher	Price.		Drop.	Price.	Cipher.
Befit .....	\$2 50	$1\frac{3}{16}$	8	\$4 50	Belted.
Befitting .....	2 65		10	4 65	Bemol.
Befriend.....	2 80		12	4 80	Bemourn.
Begetter.....	3 00		14	5 00	Beneath.
Begird.....	3 20		16	5 20	Benefice.
Begone.....	3 40		18	5 40	Benison.
Begot.....	3 10	$1\frac{7}{16}$	8	\$5 20	Benitier.
Begotten.....	3 30		10	5 40	Benoit.
Begrime.....	3 50		12	5 60	Benumb.
Begrudge.....	3 70		14	5 80	Benzoïn.
Rehead.....	3 90		16	6 00	Bercail.
Behind.....	4 10		18	6 20	Berceau.
Beholden.....	4 40		20	6 40	Bereft.

WICK OILING.		Diameter of Shaft.	RING OILING.		
Cipher.	Price.		Drop.	Price.	Cipher.
Behoove.....	\$ 3 75	1 11/16	8	\$ 6 10	Berlue.
Related.....	4 00		10	6 30	Berried.
Belay.....	4 25		12	6 60	Berzelite.
Belgard.....	4 50		14	6 90	Beshrew.
Belgie.....	4 80		16	7 20	Besmear.
Belief.....	5 10		18	7 50	Besmoke.
Believer.....	5 40		20	7 80	Besoin.
Bellicose.....	5 70		22	8 10	Besotted.
Belliger.....	6 00		24	8 40	Besought.
Beloved.....	4 40	1 15/16	8	7 10	Bespatter.
Beltane.....	4 65		10	7 30	Bestial.
Bestowal.....	4 90		12	7 60	Bitumen.
Bestride.....	5 20		14	7 90	Bivalve.
Betoken.....	5 50		16	8 20	Bivouac.
Betray.....	5 80		18	8 50	Bizarre.
Betroth.....	6 10		20	8 80	Blabber.
Bewail.....	6 40		22	9 10	Blackboy.
Beyond.....	6 70		24	9 40	Flackey.
Bibber.....	7 00		26	10 30	Blackjack.
Riberest.....	7 90		30	11 30	Blackness.
Bibheart.....	9 80		36	12 30	Blanched.
Biblical.....	5 40	2 3/16	8	8 10	Blandness.
Biceps.....	5 65		10	8 40	Blarney.
Bichon.....	5 90		12	8 70	Blatant.
Bickering.....	6 20		14	9 00	Blazer.
Bicorne.....	6 50		16	9 30	Bleakness.
Biddy.....	6 80		18	9 60	Bleared.
Biennial.....	7 10		20	9 90	Bleating.
Bientot.....	7 40		22	10 20	Blend.
Biferous.....	7 70		24	10 60	Blending.
Bitold.....	8 80		27	12 00	Blest.
Bigamist.....	9 80		30	12 70	Blew.
Bigler.....	10 80		36	13 50	Blight.
Bigness.....	6 70	2 7/16	10	9 80	Blindage.
Bigoted.....	6 95		12	10 00	Blindly.
Bile.....	7 20		14	10 30	Blinkard.
Bilious.....	7 50		16	10 60	Blissful.
Bilking.....	7 80		18	10 90	Blister.
Bilowy.....	8 10		20	11 20	Blithely.
Bilobate.....	8 40		22	11 50	Blotted.
Binary.....	8 70		24	11 80	Blottale.
Biology.....	10 50		27	13 80	Blomary.
Biped.....	11 20		30	14 50	Blond.
Birchrod.....	12 00		36	15 20	Bloodless.
Birchen.....	7 60	2 11/16	10	11 00	Blooming.
Birchwood.....	7 90		12	11 30	Blotchy.
Birdcall.....	8 20		14	11 60	Blotless.
Birdlime.....	8 50		16	11 90	Bluebell.
Birdseve.....	8 80		18	12 20	Bluffness.
Biscotine.....	9 10		20	12 50	Blunting.
Bismuth.....	9 40		22	12 80	Blurting.
Bisquain.....	9 70		24	13 10	Blush.
Biston.....	11 50		27	15 10	Blutage.
Bitless.....	12 20		30	16 00	Boarish.
Bitterly.....	13 00		36	16 90	Boaster.
Boastful.....	8 50	2 15/16	10	12 10	Boudoir.
Bobance.....	8 80		12	12 40	Boulette.
Robaill.....	9 10		14	12 70	Bouncer.
Bocage.....	9 40		16	13 00	Bounty.



WICK OILING.		Diameter of Shaft.	RING OILING.		
Cipher.	Price.		Drop.	Price.	Cipher.
Bocardo.....	\$9 70	2 15/16	13	\$13 30	Bouquetts.
Bodice.....	10 00		20	13 00	Bourse.
Rodkin.....	10 30		22	14 00	Bovine.
Boggle.....	10 70		24	14 40	Bowery.
Bolling.....	12 50		27	16 00	Bowler.
Boisson.....	13 30		30	17 20	Boxer.
Boite.....	14 20		36	18 40	Boyhood.
Boldness.....	10 50	3 1/16	13	15 10	Brabble.
Boletic.....	10 90		14	15 50	Bracing.
Bolus.....	11 30		16	15 90	Bragg.
Bombance.....	11 70		18	16 30	Braggart.
Bombard.....	12 10		20	16 70	Bragless.
Bombic.....	12 50		22	17 10	Brainless.
Bonbon.....	13 00		24	17 60	Branching.
Bondage.....	14 20	3 7/16	27	18 80	Brandish.
Bondsman.....	15 20		30	19 90	Braquer.
Boneless.....	16 30		36	21 00	brassier.
Boneset.....	12 30		13	17 80	Bravado.
Nonfire.....	12 80		14	18 30	Bravery.
Nonify.....	13 30		16	18 80	Brawler.
Bonjour.....	13 80		18	19 30	Brawney.
Bookcover.....	14 20	3 11/16	20	19 80	Breakage.
Booted.....	14 80		22	20 30	Breasted.
Bootikin.....	15 30		24	20 80	Breather.
Bootless.....	16 20		27	21 80	Breathless.
Borable.....	17 30		30	22 90	Brebia.
Boracious.....	18 50		36	24 00	Breches.
Bordage.....	14 10	3 15/16	13	21 00	Breeding.
Boreal.....	14 60		14	21 40	Brethren.
Borne.....	15 10		16	21 80	Brevity.
Bornous.....	15 60		18	22 20	Brewing.
Borough.....	16 10		20	22 60	Bribeless.
Borsella.....	16 60		22	23 00	Bribery.
Bosom.....	17 20		24	23 50	Brickbat.
Bossage.....	18 00	3 15/16	27	24 30	Brick.
Potanist.....	19 10		30	25 60	Brickman.
Bother.....	20 30		36	27 00	Brickwork.
Bridler.....	15 90		13	23 00	Briskness.
Brief.....	16 40		14	23 50	Bristled.
Briefless.....	16 90		16	24 00	Broadcast.
Brigose.....	17 40		18	24 50	Broadly.
Brimful.....	18 00	3 15/16	20	25 10	Broadness.
Brimless.....	18 60		22	25 70	Brocade.
Brimble.....	19 20		24	26 30	Brocart.
Brinish.....	20 00		27	27 00	Broccoli.
Briquet.....	21 10		30	28 50	Brodekin.
Brisket.....	22 20		36	30 00	Broggle.



**CUT NO. 57. RING-OILING BALL  
AND SOCKET ADJUSTABLE  
POST HANGERS.**

## **Ring-Oiling Ball and Socket Adjustable Post Hangers.**

**BABBITTED BEARINGS.**

**FOR PRICE LIST SEE PAGE 79.**

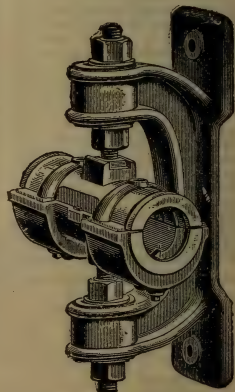
Ring-Oiling Ball and Socket Adjustable Post Hangers have bearings similar in construction to our Ring-Oiling Double Brace Ball and Socket Hangers as described on page 82.

## **Ring-Oiling Screw Adjustable Post Hangers.**

**BABBITTED BEARINGS.**

**FOR PRICE LIST SEE PAGE 79.**

Ring-Oiling Screw Adjustable Post Hangers have bearings similar in construction to our Ring-Oiling Double Brace Screw Hangers as described on page 82, except that the lateral adjustment is obtained by means of slotted holes in the bracket, greatly facilitating their erection on posts not in line.



**CUT NO. 58. RING-OILING  
SCREW ADJUSTABLE  
POST HANGERS.**

## RING OILING ADJUSTABLE POST HANGERS.

BALL AND SOCKET, Adjustable Vertically, (See Cut No. 57.)

SCREW HANGER, Adjustable in All Directions, (See Cut No. 58.)

## Babbitted Bearings.

DESCRIPTION ON PAGE 78.

Diameter of Shaft.....	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	83/16
Length of Bearing.....	6	6	7	8	9	10	11	12	13
Length over all.....	81/4	81/4	91/4	10	113/8	123/8	133/8	143/8	153/4
From center of Shaft to back of Hanger.....	6	6	6	6	6	6	71/2	71/2	71/2

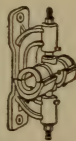
  

Diameter of Shaft.....	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Length of Bearing.....	14	15	16	17	18	19	20	22	24
Length over all.....	163/8	171/2	19	20	201/2	22	231/2	25	271/2
From center of Shaft to back of Hanger.....	71/2	81/2	81/2	81/2	81/2	81/2	91/2	91/2	91/2

Length of Bearings can not be changed.



SCREW HANGER.



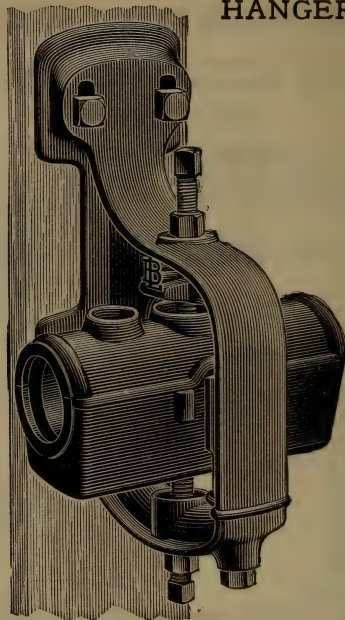
BALL AND SOCKET.

SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.	
Cipher.	Price.		Price.	Cipher.
Broiled.....	\$4 80	1 3/16	\$6 40	Buffoon.
Brokenly.....	5 40	1 7/16	7 00	Cabalist.
Brood.....	6 00	1 11/16	8 00	Caballar.
Brooklet.....	7 10	1 15/16	9 10	Cabanero.
Brotherly.....	8 30	2 3/16	10 20	Cabasset.
Browbeat.....	9 50	2 7/16	11 30	Cabman.
Brucelle.....	11 20	2 11/16	13 10	Caboche.
Bruised.....	12 00	2 15/16	15 10	Cabotage.
Brulable.....	15 60	3 3/16	17 30	Cabriolet.
Brulant.....	18 40	3 7/16	19 30	Cabrank.
Brumal.....	20 70	3 11/16	21 50	Cabrero.
Brunette.....	22 80	3 15/16	23 80	Cabstand.
Brusque.....	25 00	4 3/16	26 00	Cachet.
Bruteness.....	27 20	4 7/16	28 20	Cackler.
Buccan.....	30 30	4 11/16	31 20	Cactus.
Buckram.....	33 40	4 15/16	34 20	Cadalso.
Buckskin.....	41 40	5 7/16	42 20	Cadaver.
Bucolic.....	49 70	5 15/16	51 20	Cadbate.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.

POST

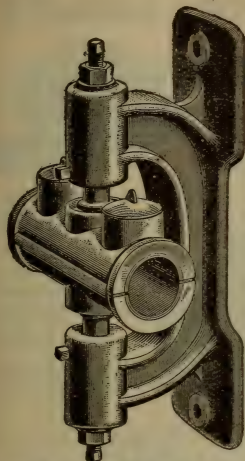
HANGERS

**ADJUSTABLE POST HANGERS.****SELF-OILING—NON-DRIPPING.**

Size of Shaft.	Length of Boxes.	Distance from Back to Center.	Price.
1 3-16	7 $\frac{1}{2}$		\$ 4 55
1 7-16	8 $\frac{1}{2}$		5 15
1 11-16	9		6 50
1 15-16	9 $\frac{5}{8}$	4 $\frac{3}{8}$	7 70
2 3-16	10 $\frac{1}{2}$	5	9 70
2 7-16	11 $\frac{1}{2}$	5	12 25
2 11-16	12 $\frac{1}{2}$	5 $\frac{3}{4}$	15 50
2 15-16	12 $\frac{3}{4}$	5 $\frac{3}{4}$	19 45
3 3-16	13 $\frac{1}{2}$	6 $\frac{3}{4}$	24 85
3 7-16	14 $\frac{1}{4}$	6 $\frac{3}{4}$	31 45
3 11-16	15	7 $\frac{1}{2}$	38 50
3 15-16	15 $\frac{3}{4}$	7 $\frac{1}{2}$	45 60
4 7-16	17	9 $\frac{1}{2}$	53 10
4 15-16	20 $\frac{3}{4}$	10 $\frac{3}{8}$	60 60
5 7-16	24 $\frac{1}{2}$		77 40
5 15-16	26 $\frac{1}{4}$		94 00

**ORDERS PROMPTLY FILLED FROM LARGE STOCKS.**





CUT NO. 59. WICK-OILING BALL  
AND SOCKET ADJUSTABLE  
POST HANGERS.

## Wick-Oiling Ball and Socket Adjustable Post Hangers.

BABBITTED BEARINGS.

FOR PRICE LIST SEE PAGE 82.

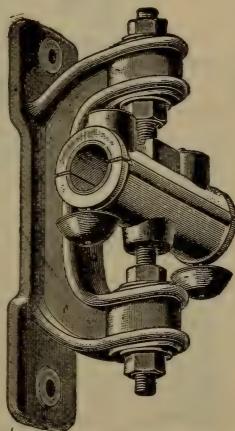
Wick-Oiling Ball and Socket Adjustable Post Hangers have bearings similar in construction to our Wick-Oiling Double Brace Ball and Socket Hangers, as described on page 84.

## WICK-OILING SCREW ADJUSTABLE POST HANGERS.

BABBITTED BEARINGS.

FOR PRICE LIST SEE PAGE 82.

Wick-Oiling Screw Adjustable Post Hangers have bearings similar in construction to our Wick-Oiling Double Brace Screw Hangers as described on Page 84. except that the lateral adjustment is obtained by means of slotted holes in the bracket, greatly facilitating their erection on posts not in line.



CUT NO. 60. WICK-OILING  
SCREW ADJUSTABLE  
POST HANGERS.

# WICK OILING ADJUSTABLE POST HANGERS.

**BALL AND SOCKET**, Adjustable Vertically, (See Cut No. 59.)

**SCREW HANGER**, Adjustable in All Directions, (See Cut No. 60.)

## Self-Oiling, Babbitted Bearings.

### DESCRIPTION ON PAGE 78.

Diameter of Shaft.....	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16
Length of Bearing....	6	6	7	8	9	10	11	12	12
From center of Shaft to back of Hanger.....	6	6	6	6	6	6	7 1/2	7 1/2	7 1/2

Diameter of Shaft.....	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Length of Bearing.....	12 1/2	13	14	14 1/2	15	15 1/2	16	17	18
From center of Shaft to back of Hanger.....	7 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	9 1/2	9 1/2	9 1/2

For longer Bearings see page 63.



SCREW HANGER.



BALL AND SOCKET.

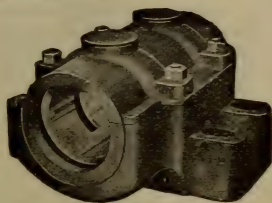
SCREW HANGERS.		Diameter of Shaft.	BALL AND SOCKET.	
Cipher.	Price.		Price.	Cipher.
Cadeau.....	\$3 30	1 3/16	\$4 80	Calepino.
Cadence.....	3 90	1 7/16	5 40	Calfat.
Caducity.....	4 50	1 11/16	6 10	Calidity.
Cafard.....	5 30	1 15/16	6 90	Caliente.
Caftan.....	6 20	2 3/16	7 80	Callbell.
Cagmag.....	7 20	2 7/16	8 80	Callbird.
Cagnard.....	8 50	2 11/16	10 40	Callboy.
Caiff.....	10 00	2 15/16	12 00	Callcard.
Cajole.....	12 00	3 3/16	13 50	Calmly.
Cakebread.....	14 00	3 7/16	14 80	Calmness.
Calabash.....	16 00	3 11/16	16 80	Caltraps.
Calamity.....	18 00	3 15/16	18 60	Calvish.
Calavera.....	20 00	4 3/16	20 80	Calvitie.
Calcine.....	22 50	4 7/16	23 30	Calyx.
Calceton.....	25 00	4 11/16	25 70	Cambist.
Calcium.....	28 00	4 15/16	28 75	Cambrel.
Calcule.....	32 50	5 7/16	33 50	Camelot.
Calculus.....	38 00	5 15/16	39 10	Campaign.

Can furnish Hangers for all intermediate sizes of shaft, at price of nearest size listed.

## Rigid Pillow Blocks



Standard Rigid Pillow Block



Self-Oiling Rigid Pillow Block

Bearings Machine-Reamed and Faced

## Price List

Size in inches	St'n'd	Self Oiling
1 $\frac{3}{16}$ & 1 $\frac{1}{4}$	\$ 1.60	
1 $\frac{7}{16}$ & 1 $\frac{1}{2}$	2.10	\$ 5.00
1 $\frac{11}{16}$ & 1 $\frac{3}{4}$	2.65	6.50
1 $\frac{13}{16}$ & 2	3.40	8.00
2 $\frac{3}{16}$ & 2 $\frac{1}{4}$	4.00	10.25
2 $\frac{7}{16}$ & 2 $\frac{1}{2}$	4.90	12.50
2 $\frac{11}{16}$ & 2 $\frac{3}{4}$	6.10	15.25
2 $\frac{13}{16}$ & 3	7.80	18.00
3 $\frac{3}{16}$ & 3 $\frac{1}{4}$	9.40	21.00
3 $\frac{7}{16}$ & 3 $\frac{1}{2}$	11.00	24.00
3 $\frac{11}{16}$ & 3 $\frac{3}{4}$	13.30	28.00
3 $\frac{13}{16}$ & 4	16.60	33.00
4 $\frac{7}{16}$ & 4 $\frac{1}{2}$	21.80	46.00
4 $\frac{11}{16}$ & 5	26.40	62.00

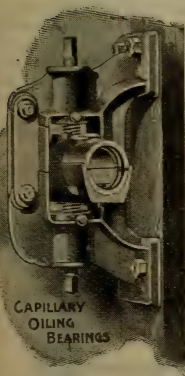
## Adjustable Ball and Socket Post Hangers

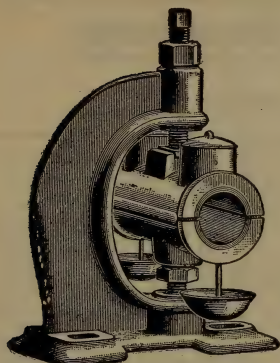
## Price List

Size in Inches	Standard Bearings		Capillary Bearings	
	Single Brace	Double Brace	Single Brace	Double Brace
1 $\frac{3}{16}$ & 1 $\frac{1}{4}$	\$ 4.60	\$ 5.00	\$ 5.60	\$ 5.95
1 $\frac{7}{16}$ & 1 $\frac{1}{2}$	5.15	5.50	5.95	6.30
1 $\frac{11}{16}$ & 1 $\frac{3}{4}$	5.25	5.60	6.20	6.55
1 $\frac{13}{16}$ & 2	6.65	7.15	8.55	9.05
2 $\frac{3}{16}$ & 2 $\frac{1}{4}$	9.20	9.75	11.20	11.75
2 $\frac{7}{16}$ & 2 $\frac{1}{2}$	9.85	10.40	11.80	12.35
2 $\frac{11}{16}$ & 2 $\frac{3}{4}$	12.20	13.00	14.80	15.60
2 $\frac{13}{16}$ & 3	14.15	14.95	17.55	18.35
3 $\frac{3}{16}$ & 3 $\frac{1}{4}$	17.95	19.00	26.25	27.30
3 $\frac{7}{16}$ & 3 $\frac{1}{2}$	18.40	19.45	28.60	29.65
3 $\frac{11}{16}$ & 3 $\frac{3}{4}$	24.25	25.45	32.85	34.05
3 $\frac{13}{16}$ & 4	27.50	28.70	34.60	35.80
4 $\frac{7}{16}$ & 4 $\frac{1}{2}$	32.55	34.10	40.65	42.20
4 $\frac{11}{16}$ & 5	44.45	46.40	56.85	58.80

Single or Double Braced

Bearings Machine Reamed and Faced

CAPILLARY  
OILING  
BEARINGS

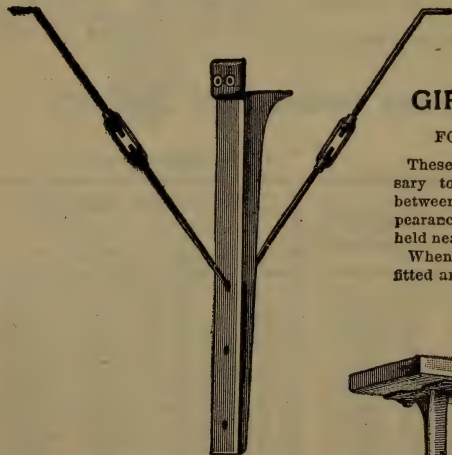


OUT NO. 61. WICK-OILING SCREW  
ADJUSTABLE PILLOW BLOCKS.

## WICK-OILING SCREW ADJUSTABLE PILLOW BLOCKS.

FOR PRICE LIST SEE PAGE 85.

These Pillow Blocks are adjustable in every direction and are similar to our single brace hanger. They are furnished with automatic wick-oiling babbitted bearings. The entire surface of the bearing is babbitted, there being no rib to come in contact with the shaft. The ends of the boxes are faced off in lathe after being babbitted. These Pillow Blocks may be inverted and used as short drop hangers.



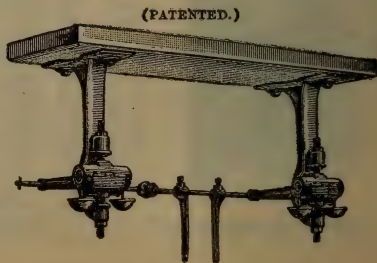
OUT NO. 27. GIRDER HANGERS.

## GIRDER HANGERS.

FOR PRICE LIST SEE PAGE 85.

These Hangers are used when it is necessary to have an intermediate bearing between posts. They are neat in appearance, and are very rigid, being firmly held near the bearing by wrought iron guys.

When ordered with Post Hangers they are fitted and bolted to same.



OUT NO. 28. COUNTERSHAFT HANGERS.





## GIRDER HANGERS.

To be used with either Rigid or Adjustable Post Hangers, Bracket Pillow Blocks or Slotted Brackets.

SEE CUT No. 27.

DESCRIPTION ON PAGE 84.

Diameter of Shaft.....	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	237/16	253/16	271/16	287/16	311/16	315/16
Cipher.....	Yankoe	Yachtling	Yawl	Yearling	Yellow	Yeoman	Yonker	Youthful	Yourselt	Youngster	Youngish	Yttria		
Price.....	\$6 00	6 50	7 00	7 50	8 30	9 10	9 70	10 60	11 50	12 75	13 60	15 00		

The drop is from bottom of Girder to center of shaft. In ordering, when convenient, state the depth of Girder. We make these Hangers any drop, from 30 inches down. For each additional 2 inches drop add 12 cents net.

## ADJUSTABLE PILLOW BLOCKS.

ADJUSTABLE IN ALL DIRECTIONS. SELF-OILING BABBITTED BEARINGS.

SEE CUT No. 61.

DESCRIPTION ON PAGE 84.



Diameter of Shaft.....	13/16	17/16	111/16	115/16	23/16	* 27/16	211/16	215/16	237/16	253/16	271/16	287/16	311/16	315/16
Length of Bearing.....	6	6	7	8	9	10	11	12	12	12	12 1/2	14	14	14
Cipher.....	Cashier	Casino	Casato	Casstock	Caster	Casual	Catalan	Castall	Catcher	Catgut	Caulker	Cavate		
Price.....	\$4 00	4 70	5 50	6 30	7 50	8 60	9 80	11 00	12 80	14 50	16 50	18 00		

## RING-OILING BALL AND SOCKET PILLOW BLOCKS.

### BABBITTED BEARINGS.

FOR PRICE LIST SEE PAGE 87.

These Pillow Blocks are extra heavy, the lengths of bearings being four (4) times the diameter of the shaft, and are true Ball and Socket, the radius of the ball being struck from the center of the shaft, which is not the case in many other makes.

They are supplied with ring-oiling device, which consists of rings which pass around the shaft and down into the reservoir.

These rings revolve with the shaft, and continually convey a generous amount of oil to the bearings.

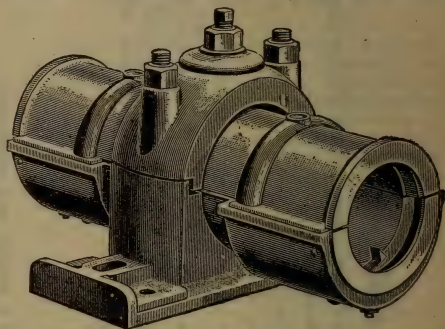
The reservoir is large, and holds a good supply of oil.

The boxes are faced off at the ends.

These are oil saving bearings, the boxes being furnished with a wiper which wipes the oil from the shaft at the ends of the bearings, causing it to return to the reservoir from whence it is again used.

There is a plug in the bottom of the reservoir which can be removed should it be necessary to drain out the oil.

We can furnish these pillow blocks with or without base plates. (See lists.)

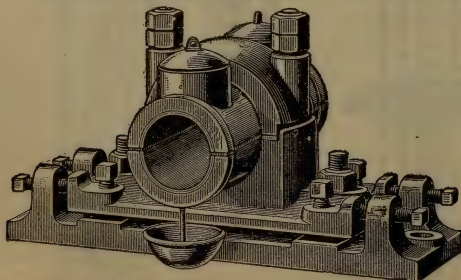


CUT NO. 62. RING-OILING BALL AND SOCKET PILLOW BLOCKS.

## WICK-OILING BALL AND SOCKET PILLOW BLOCKS.

FOR PRICE LIST SEE PAGE 87.

These Pillow Blocks are very substantially constructed, have extra long bearings, the entire



CUT NO. 29. WICK-OILING BALL AND SOCKET PILLOW BLOCKS.

surface of which is babbitted, there being no ribs to come in contact with the shaft, and the ends of boxes are faced off in lathe after being babbitted. They are self-oiling, and one filling of reservoir will lubricate the bearing for from six to twelve months, depending on the speed at which the shaft is run. The illustration shows Pillow Block on base plate. The base plate gives both lateral and vertical adjustment, and greatly facilitates keeping the shaft accurately in line. This Pillow Block is easy to line up, as the bearing adjusts itself to the line of the shaft. We can furnish these Pillow Blocks with or without base plates.



# WICK OILING BALL AND SOCKET PILLOW BLOCKS. SELF-OILING BABBITTED BEARINGS.

SEE CUT NO. 29. DESCRIPTION ON PAGE 86. FOR LONGER BEARINGS SEE PAGE 93.

Diam. of Shaft.	13/16	17/16	11/16	115/16	23/16	27/16	21/16	37/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Length of Bearing.	6	6	7	8	9	10	10	12	12	12	14	14	15	15	16	17	18
From Bottom to Center of Shaft.	2 1/2	2 1/2	3	3	3 1/2	3 1/2	3 1/2	4	4	4 1/2	4 1/2	5 1/2	5 1/2	5 1/2	5 1/2	6 1/2	6 1/2
Cipher, Without Base Plate.	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern	Car-ern
Price, Without Base Plate.	\$3 00	\$3 60	\$4 30	\$5 00	\$5 70	\$6 60	\$6 60	\$8 00	\$9 20	\$10 40	\$11 60	\$13 20	\$14 80	\$16 80	\$18 90	\$21 50	\$24 00
Price, With Base Plate.	\$7 00	\$8 00	\$9 10	\$10 25	\$11 50	\$12 80	\$14 60	\$16 30	\$18 10	\$19 60	\$22 20	\$24 80	\$27 80	\$31 40	\$35 35	\$39 00	\$43 00
Cipher, With Base Plate.	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo	Car-allo



# RING OILING BALL AND SOCKET PILLOW BLOCKS. SELF-OILING BABBITTED BEARINGS.

SEE CUT NO. 62.

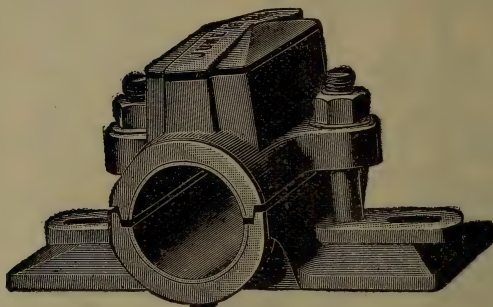
DESCRIPTION ON PAGE 86.

Diam. of Shaft.	13/16	17/16	111/16	115/16	23/16	27/16	21/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Length of Bearing.	6	6	7	8	9	10	10	11	12	13	14	15	16	17	18	19	20	22	24
Length over Ill.	8 1/2	8 1/2	9 1/2	10 1/2	11 1/2	12 1/2	13 1/2	14 1/2	15 1/2	16 1/2	17 1/2	18 1/2	19 1/2	20 1/2	21 1/2	22 1/2	23 1/2	25 1/2	27 1/2
From Bottom to Center of Shaft.	2 1/2	2 1/2	3	3	3 1/2	3 1/2	4	4	4	4 1/2	4 1/2	4 1/2	4 1/2	5 1/2	5 1/2	5 1/2	5 1/2	6 1/2	6 1/2
Cipher, Without Base Plate.	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot	Char-lot
Price, Without Base Plate.	\$4 00	\$5 60	\$6 50	\$7 50	\$8 60	\$9 80	\$11 40	\$13 00	\$14 50	\$16 00	\$18 60	\$21 50	\$23 30	\$25 00	\$28 50	\$32 00	\$35 50	\$40 00	\$45 00
Price, With Base Plate.	\$8 00	\$10 00	\$11 40	\$12 70	\$14 40	\$16 00	\$18 00	\$20 10	\$22 20	\$24 00	\$27 60	\$31 50	\$34 30	\$37 50	\$42 00	\$47 00	\$52 50	\$58 00	\$63 00
Cipher, With Base Plate.	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on	Chick-on

**RIGID PILLOW BLOCKS.****SELF-OILING BABBITTED BEARINGS.**

FOR PRICE LIST SEE PAGE 89.

(PATENTED.)



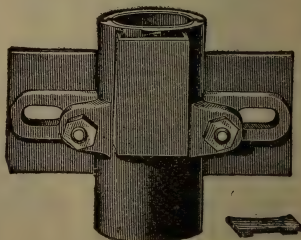
CUT NO. 30. RIGID PILLOW BLOCKS.

Our Pillow Block is a new departure in this line. The entire surface of the bearing is babbitted, there being no ribs to come in contact with the shaft, and the ends of Pillow Blocks are faced off in lathe after being babbitted. The oil reservoir is on top, which does away with the annoyance of removing the cap from its bearings for inspection. The oil is fed by siphonic action, and the wick running parallel with the bearings feeds the oil its entire length. The wick can be easily replaced. They do not require a special kind of wick; hemp twine or the like will answer; and the feed can be governed by the number of strands, and one filling of reservoir will lubricate bearings for from six to twelve months, according to speed at which shaft is run. These Pillow Blocks are furnished with two slotted holes in base which give lateral adjustment. We can furnish these Pillow Blocks arranged for vertical shafts at price of regular Pillow Blocks. (See cut No. 31.)

**VERTICAL SHAFT BOX.**

FOR PRICE LIST SEE LIST ON RIGID PILLOW BLOCKS, PAGE 89.

These Boxes are made like the Rigid Pillow Blocks except that the reservoir is arranged for the box to be used in a vertical position.



CUT NO. 31. VERTICAL SHAFT BOX.



## RIGID PILLOW BLOCKS.

HORIZONTAL AND VERTICAL—SELF-OILING BABBITTED BEARINGS.

VERTICAL PILLOW BLOCK, SEE CUT NO. 31. HORIZONTAL PILLOW BLOCK, SEE CUT NO. 80.

DESCRIPTION ON PAGE 88

Diameter of Shaft..	13/16	1 1/16	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 1/2	3 3/4	4	4 1/8	4 1/4	4 1/2	4 3/4	5	5 1/8	5 1/4	5 1/2	5 3/4	6
Length of Bearing..	4 1/2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Cipher Without Base Plate.....	Sutton	Sebold	Segar	Segrave	Seibel	Selby	Sellers	Sellers	Sallow	Belts	Beltdor	Sample	Senden	Senter	Seydel	Seymour	Shade	Shanks	Sharkley								
Price Without Base Plate.....	\$1 40	1 60	2 00	2 50	3 00	3 50	4 00	4 50	5 40	6 30	7 20	8 50	9 80	11 10	13 60	15 50	18 80	22 10									
Price With Base Plate.....	\$5 40	6 00	6 80	7 75	8 80	9 70	10 60	11 60	13 15	14 50	16 10	18 50	20 80	23 50	27 40	30 25	34 80	39 60									
Cipher With Base Plate.....	Sharpe	Shaw	Shay	Shets	Sheldon	Shelp	Sherrwood	Shine	Shipman	Shipton	Shirley	Short	Sibler	Sickle	Sidney	Silence	Silver	Sinceer									

We furnish Bearings for intermediate sized Shafts at price of nearest size listed. For Longer Bearing see page 93.

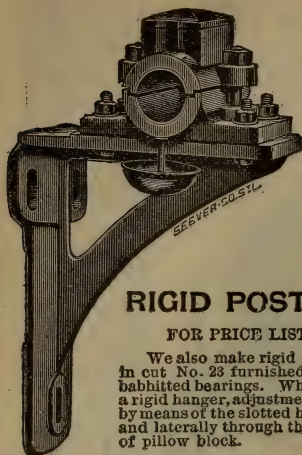
## BRACKET PILLOW BLOCKS.

SELF-OILING BABBITTED BEARINGS.

SEE CUT NO. 26. FOR LONGER BEARINGS SEE PAGE 93.

DESCRIPTION ON PAGE 90.

Diameter of Shaft.....	13/16	1 1/16	1 1/8	1 1/4	1 1/2	1 3/4	2	2 1/8	2 1/4	2 1/2	2 3/4	3	3 1/8	3 1/4	3 1/2	3 3/4	4	4 1/8	4 1/4	4 1/2	4 3/4	5	5 1/8	5 1/4	5 1/2	5 3/4	6
Length of Bearing.....	4 1/2	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
From Center of Shaft to Back of Bracket.....	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	6 1/2	6 1/4	6 1/2	6 1/4	6 1/2	6 1/4	6 1/2	6 1/4	6 1/2
Cipher.....	Sindair	Nison	Sitting	Skates	Skellon	Skidmore	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner	Skiff	Skinner
Price.....	\$1 80	2 20	2 90	3 70	4 50	5 50	6 50	7 10	8 00	9 00	10 20	11 10	12 10	13 10	14 10	15 10	16 10	17 10	18 10	19 10	20 10	21 10	22 10	23 10	24 10	25 10	26 10



## RIGID POST HANGERS.

FOR PRICE LIST SEE PAGE 91.

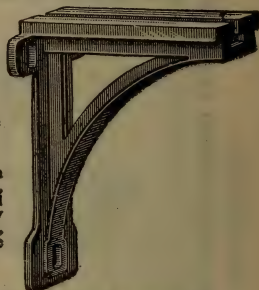
We also make rigid post hangers as shown in cut No. 23 furnished with self-oiling box, babbitted bearings. While the hanger is called a rigid hanger, adjustment can be had vertically by means of the slotted holes in back of bracket, and laterally through the slotted holes in base of pillow block.

CUT NO. 23. RIGID POST HANGER.

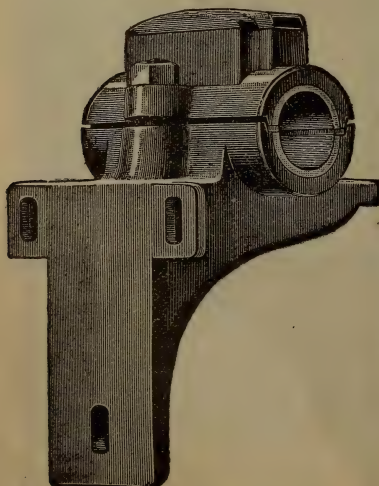
## SLOTTED BRACKETS.

FOR PRICE LIST SEE PAGE 91.

We also furnish a Slotted Bracket, to which a pillow block may be attached for use where it is desirable to get a longer extension from wall or post than can be obtained by using a rigid or adjustable post hanger. The price list is on the bracket only. When ordering state whether you want common flat boxes, rigid or ball and socket pillow blocks attached.



CUT NO. 24. SLOTTED BRACKET.



## BRACKET PILLOW BLOCK.

FOR PRICE LIST SEE PAGE 89.

Self-oiling, the entire surface of the bearing is babbitted, there being no ribs to come in contact with the shaft, and are desirable when it is necessary to run the shaft nearer to the post or wall than will be permitted when rigid or adjustable post hangers are used. These Pillow Blocks are of a very neat design.

CUT NO. 25. BRACKET PILLOW BLOCK.



## RIGID POST HANGERS.

Bracket Adjustable Vertically—Box Adjustable Laterally—Self-Oiling Babbitted Bearings.

SEE CUT No. 23.

DESCRIPTION ON PAGE 90.

For Longer Bearings see page 93.

Diameter of Shaft.....	13/16	17/16	11 1/16	11 1/16	11 1/16	23/16	27/16	21 1/16	23 7/16	33/16	37/16	31 1/16	35 1/16	43/16	47/16	41 1/16	45 1/16	57/16	3 1/2
Length of Bearing.....	4 1/2	5	6	6	7	7 1/2	8	8 1/2	9	9 1/2	10	11	12	13	13	14	15	16 1/2	18
From Center of Shaft to Back of Hanger	5 1/2	6 1/2	6 1/2	6 1/2	7	7 1/2	8	8 1/2	9	9 1/2	10	11	12	13	13	14	15	16 1/2	18
Cipher.....	Wet- sels	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan	Wha- lan
Price.....	\$2.95	3.30	4.10	4.80	5.60	6.40	7.20	8.00	8.80	9.60	10.40	11.20	12.00	12.80	13.60	14.40	15.20	16.00	16.80

Can furnish Hangers for intermediate sizes of shaft, at price of nearest size listed.



## SLOTTED BRACKETS.

WITHOUT PILLOW BLOCK, BUT INCLUDING BOLTS TO FASTEN PILLOW BLOCK.

SEE CUT No. 24.

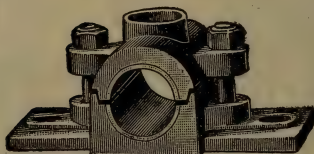
DESCRIPTION ON PAGE 90.

Diameter of Shaft..	13/16	17/16	11 1/16	11 1/16	11 1/16	23/16	27/16	21 1/16	23 7/16	33/16	37/16	31 1/16	35 1/16	43/16	47/16	41 1/16	45 1/16	57/16	3 1/2
Cipher... of Shaft to	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat	Wild- cat
Center of Shaft to	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8
Back of Bracket	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8	3 3/8
Price.....	\$3.00	3.35	4.10	4.85	5.60	6.35	7.10	7.85	8.60	9.35	10.10	10.85	11.60	12.35	13.10	13.85	14.60	15.35	16.10

Can furnish Hangers for intermediate sizes of shaft, at price of nearest size listed.

## COMMON FLAT BOXES.

FOR PRICE LIST SEE PAGE 93.



CUT NO. 32. COMMON FLAT BOXES.

Have entire surface of bearing babbitted, there being no ribs to come in contact with the shaft, and the ends of boxes are faced off in lathe after babbitting. These boxes are not self-oiling, and are cheaper than the Rigid Pillow Blocks.

## SOLID JOURNAL BOXES.

FOR PRICE LIST SEE PAGE 93.



CUT NO. 33. SOLID JOURNAL BOXES.

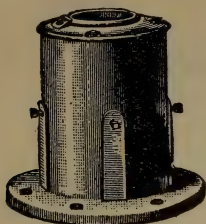
Cast all in one piece, bearings bored not babbitted.



## COMMON FLAT BOXES—BABBITTED BEARINGS.

SEE CUT NO 32. DESCRIPTION ON PAGE 92.

Diameter of Shaft.....	1	1 1/16	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/4	2 3/8	2 1/2	2 5/8	2 3/4	2 7/8	3	3 1/8	3 1/4	3 3/8	3 1/2	3 5/8	3 3/4	3 7/8	4	4 1/8	4 1/4	4 3/8	4 1/2	4 5/8	4 3/4	4 7/8	5	5 1/8	5 1/4	5 3/8	5 1/2	5 5/8	5 3/4	5 7/8	6	6 1/8	6 1/4	6 3/8	6 1/2	6 5/8	6 3/4	6 7/8	7	7 1/8	7 1/4	7 3/8	7 1/2	7 5/8	7 3/4	7 7/8	8	8 1/8	8 1/4	8 3/8	8 1/2	8 5/8	8 3/4	8 7/8	9	9 1/8	9 1/4	9 3/8	9 1/2	9 5/8	9 3/4	9 7/8	10	10 1/8	10 1/4	10 3/8	10 1/2	10 5/8	10 3/4	10 7/8	11	11 1/8	11 1/4	11 3/8	11 1/2	11 5/8	11 3/4	11 7/8	12	12 1/8	12 1/4	12 3/8	12 1/2	12 5/8	12 3/4	12 7/8	13	13 1/8	13 1/4	13 3/8	13 1/2	13 5/8	13 3/4	13 7/8	14	14 1/8	14 1/4	14 3/8	14 1/2	14 5/8	14 3/4	14 7/8	15	15 1/8	15 1/4	15 3/8	15 1/2	15 5/8	15 3/4	15 7/8	16	16 1/8	16 1/4	16 3/8	16 1/2	16 5/8	16 3/4	16 7/8	17	17 1/8	17 1/4	17 3/8	17 1/2	17 5/8	17 3/4	17 7/8	18	18 1/8	18 1/4	18 3/8	18 1/2	18 5/8	18 3/4	18 7/8	19	19 1/8	19 1/4	19 3/8	19 1/2	19 5/8	19 3/4	19 7/8	20	20 1/8	20 1/4	20 3/8	20 1/2	20 5/8	20 3/4	20 7/8	21	21 1/8	21 1/4	21 3/8	21 1/2	21 5/8	21 3/4	21 7/8	22	22 1/8	22 1/4	22 3/8	22 1/2	22 5/8	22 3/4	22 7/8	23	23 1/8	23 1/4	23 3/8	23 1/2	23 5/8	23 3/4	23 7/8	24	24 1/8	24 1/4	24 3/8	24 1/2	24 5/8	24 3/4	24 7/8	25	25 1/8	25 1/4	25 3/8	25 1/2	25 5/8	25 3/4	25 7/8	26	26 1/8	26 1/4	26 3/8	26 1/2	26 5/8	26 3/4	26 7/8	27	27 1/8	27 1/4	27 3/8	27 1/2	27 5/8	27 3/4	27 7/8	28	28 1/8	28 1/4	28 3/8	28 1/2	28 5/8	28 3/4	28 7/8	29	29 1/8	29 1/4	29 3/8	29 1/2	29 5/8	29 3/4	29 7/8	30	30 1/8	30 1/4	30 3/8	30 1/2	30 5/8	30 3/4	30 7/8	31	31 1/8	31 1/4	31 3/8	31 1/2	31 5/8	31 3/4	31 7/8	32	32 1/8	32 1/4	32 3/8	32 1/2	32 5/8	32 3/4	32 7/8	33	33 1/8	33 1/4	33 3/8	33 1/2	33 5/8	33 3/4	33 7/8	34	34 1/8	34 1/4	34 3/8	34 1/2	34 5/8	34 3/4	34 7/8	35	35 1/8	35 1/4	35 3/8	35 1/2	35 5/8	35 3/4	35 7/8	36	36 1/8	36 1/4	36 3/8	36 1/2	36 5/8	36 3/4	36 7/8	37	37 1/8	37 1/4	37 3/8	37 1/2	37 5/8	37 3/4	37 7/8	38	38 1/8	38 1/4	38 3/8	38 1/2	38 5/8	38 3/4	38 7/8	39	39 1/8	39 1/4	39 3/8	39 1/2	39 5/8	39 3/4	39 7/8	40	40 1/8	40 1/4	40 3/8	40 1/2	40 5/8	40 3/4	40 7/8	41	41 1/8	41 1/4	41 3/8	41 1/2	41 5/8	41 3/4	41 7/8	42	42 1/8	42 1/4	42 3/8	42 1/2	42 5/8	42 3/4	42 7/8	43	43 1/8	43 1/4	43 3/8	43 1/2	43 5/8	43 3/4	43 7/8	44	44 1/8	44 1/4	44 3/8	44 1/2	44 5/8	44 3/4	44 7/8	45	45 1/8	45 1/4	45 3/8	45 1/2	45 5/8	45 3/4	45 7/8	46	46 1/8	46 1/4	46 3/8	46 1/2	46 5/8	46 3/4	46 7/8	47	47 1/8	47 1/4	47 3/8	47 1/2	47 5/8	47 3/4	47 7/8	48	48 1/8	48 1/4	48 3/8	48 1/2	48 5/8	48 3/4	48 7/8	49	49 1/8	49 1/4	49 3/8	49 1/2	49 5/8	49 3/4	49 7/8	50	50 1/8	50 1/4	50 3/8	50 1/2	50 5/8	50 3/4	50 7/8	51	51 1/8	51 1/4	51 3/8	51 1/2	51 5/8	51 3/4	51 7/8	52	52 1/8	52 1/4	52 3/8	52 1/2	52 5/8	52 3/4	52 7/8	53	53 1/8	53 1/4	53 3/8	53 1/2	53 5/8	53 3/4	53 7/8	54	54 1/8	54 1/4	54 3/8	54 1/2	54 5/8	54 3/4	54 7/8	55	55 1/8	55 1/4	55 3/8	55 1/2	55 5/8	55 3/4	55 7/8	56	56 1/8	56 1/4	56 3/8	56 1/2	56 5/8	56 3/4	56 7/8	57	57 1/8	57 1/4	57 3/8	57 1/2	57 5/8	57 3/4	57 7/8	58	58 1/8	58 1/4	58 3/8	58 1/2	58 5/8	58 3/4	58 7/8	59	59 1/8	59 1/4	59 3/8	59 1/2	59 5/8	59 3/4	59 7/8	60	60 1/8	60 1/4	60 3/8	60 1/2	60 5/8	60 3/4	60 7/8	61	61 1/8	61 1/4	61 3/8	61 1/2	61 5/8	61 3/4	61 7/8	62	62 1/8	62 1/4	62 3/8	62 1/2	62 5/8	62 3/4	62 7/8	63	63 1/8	63 1/4	63 3/8	63 1/2	63 5/8	63 3/4	63 7/8	64	64 1/8	64 1/4	64 3/8	64 1/2	64 5/8	64 3/4	64 7/8	65	65 1/8	65 1/4	65 3/8	65 1/2	65 5/8	65 3/4	65 7/8	66	66 1/8	66 1/4	66 3/8	66 1/2	66 5/8	66 3/4	66 7/8	67	67 1/8	67 1/4	67 3/8	67 1/2	67 5/8	67 3/4	67 7/8	68	68 1/8	68 1/4	68 3/8	68 1/2	68 5/8	68 3/4	68 7/8	69	69 1/8	69 1/4	69 3/8	69 1/2	69 5/8	69 3/4	69 7/8	70	70 1/8	70 1/4	70 3/8	70 1/2	70 5/8	70 3/4	70 7/8	71	71 1/8	71 1/4	71 3/8	71 1/2	71 5/8	71 3/4	71 7/8	72	72 1/8	72 1/4	72 3/8	72 1/2	72 5/8	72 3/4	72 7/8	73	73 1/8	73 1/4	73 3/8	73 1/2	73 5/8	73 3/4	73 7/8	74	74 1/8	74 1/4	74 3/8	74 1/2	74 5/8	74 3/4	74 7/8	75	75 1/8	75 1/4	75 3/8	75 1/2	75 5/8	75 3/4	75 7/8	76	76 1/8	76 1/4	76 3/8	76 1/2	76 5/8	76 3/4	76 7/8	77	77 1/8	77 1/4	77 3/8	77 1/2	77 5/8	77 3/4	77 7/8	78	78 1/8	78 1/4	78 3/8	78 1/2	78 5/8	78 3/4	78 7/8	79	79 1/8	79 1/4	79 3/8	79 1/2	79 5/8	79 3/4	79 7/8	80	80 1/8	80 1/4	80 3/8	80 1/2	80 5/8	80 3/4	80 7/8	81	81 1/8	81 1/4	81 3/8	81 1/2	81 5/8	81 3/4	81 7/8	82	82 1/8	82 1/4	82 3/8	82 1/2	82 5/8	82 3/4	82 7/8	83	83 1/8	83 1/4	83 3/8	83 1/2	83 5/8	83 3/4	83 7/8	84	84 1/8	84 1/4	84 3/8	84 1/2	84 5/8	84 3/4	84 7/8	85	85 1/8	85 1/4	85 3/8	85 1/2	85 5/8	85 3/4	85 7/8	86	86 1/8	86 1/4	86 3/8	86 1/2	86 5/8	86 3/4	86 7/8	87	87 1/8	87 1/4	87 3/8	87 1/2	87 5/8	87 3/4	87 7/8	88	88 1/8	88 1/4	88 3/8	88 1/2	88 5/8	88 3/4	88 7/8	89	89 1/8	89 1/4	89 3/8	89 1/2	89 5/8	89 3/4	89 7/8	90	90 1/8	90 1/4	90 3/8	90 1/2	90 5/8	90 3/4	90 7/8	91	91 1/8	91 1/4	91 3/8	91 1/2	91 5/8	91 3/4	91 7/8	92	92 1/8	92 1/4	92 3/8	92 1/2	92 5/8	92 3/4	92 7/8	93	93 1/8	93 1/4	93 3/8	93 1/2	93 5/8	93 3/4	93 7/8	94	94 1/8	94 1/4	94 3/8	94 1/2	94 5/8	94 3/4	94 7/8	95	95 1/8	95 1/4	95 3/8	95 1/2	95 5/8	95 3/4	95 7/8	96	96 1/8	96 1/4	96 3/8	96 1/2	96 5/8	96 3/4	96 7/8	97	97 1/8	97 1/4	97 3/8	97 1/2	97 5/8	97 3/4	97 7/8	98	98 1/8	98 1/4	98 3/8	98 1/2	98 5/8	98 3/4	98 7/8	99	99 1/8	99 1/4	99 3/8	99 1/2	99 5/8	99 3/4	99 7/8	100	100 1/8	100 1/4	100 3/8	100 1/2	100 5/8	100 3/4	100 7/8	101	101 1/8	101 1/4	101 3/8	101 1/2	101 5/8	101 3/4	101 7/8	102	102 1/8	102 1/4	102 3/8	102 1/2	102 5/8	102 3/4	102 7/8	103	103 1/8	103 1/4	103 3/8	103 1/2	103 5/8	103 3/4	103 7/8	104	104 1/8	104 1/4	104 3/8	104 1/2	104 5/8	104 3/4	104 7/8	105	105 1/8	105 1/4	105 3/8	105 1/2	105 5/8	105 3/4	105 7/8	106	106 1/8	106 1/4	106 3/8	106 1/2	106 5/8	106 3/4	106 7/8	107	107 1/8	107 1/4	107 3/8	107 1/2	107 5/8	107 3/4	107 7/8	108	108 1/8	108 1/4	108 3/8	108 1/2	108 5/8	108 3/4	108 7/8	109	109 1/8	109 1/4	109 3/8	109 1/2	109 5/8	109 3/4	109 7/8	110	110 1/8	110 1/4	110 3/8	110 1/2	110 5/8	110 3/4	110 7/8	111	111 1/8	111 1/4	111 3/8	111 1/2	111 5/8	111 3/4	111 7/8	112	112 1/8	112 1/4	112 3/8	112 1/2	112 5/8	112 3/4	112 7/8	113	113 1/8	113 1/4	113 3/8	113 1/2	113 5/8	113 3/4	113 7/8	114	114 1/8	114 1/4	114 3/8	114 1/2	114 5/8	114 3/4	114 7/8	115	115 1/8	115 1/4	115 3/8	115 1/2	115 5/8	115 3/4	115 7/8	116	116 1/8	116 1/4	116 3/8	116 1/2	116 5/8	116 3/4	116 7/8	117	117 1/8	117 1/4	117 3/8	117 1/2	117 5/8	117 3/4	117 7/8	118	118 1/8	118 1/4	118 3/8	118 1/2	118 5/8	118 3/4	118 7/8	119	119 1/8	119 1/4	119 3/8	119 1/2	119 5/8	119 3/4	119 7/8	120	120 1/8	120 1/4	120 3/8	120 1/2	120 5/8	120 3/4	120 7/8	121	121 1/8	121 1/4	121 3/8	121 1/2	121 5/8	121 3/4	121 7/8	122	122 1/8	122 1/4	122 3/8	122 1/2	122 5/8	122 3/4	122 7/8	123	123 1/8	123 1/4	123 3/8	123 1/2	123 5/8	123 3/4	123 7/8	124	124 1/8	124 1/4	124 3/8	124 1/2	124 5/8	124 3/4	124 7/8	125	125 1/8	125 1/4	125 3/8	125 1/2	125 5/8	125 3/4	125 7/8	126	126 1/8	126 1/4	126 3/8	126 1/2	126 5/8	126 3/4	126 7/8	127	127 1/8	127 1/4	127 3/8	127 1/2	127 5/8	127 3/4	127 7/8	128	128 1/8	128 1/4	128 3/8	128 1/2	128 5/8	128 3/4	128 7/8	129	129 1/8	129 1/4	129 3/8	129 1/2	129 5/8	129 3/4	129 7/8	130	130 1/8	130 1/4	130 3/8	130 1/2	130 5/8	130 3/4	130 7/8	131	131 1/8	131 1/4	131 3/8	131 1/2	131 5/8	131 3/4	131 7/8	132	132 1/8	132 1/4	132 3/8	132 1/2	132 5/8	132 3/4	132 7/8	133	133 1/8	133 1/4	133 3/8	133 1/2	133 5/8	133 3/4	133 7/8	134	134 1/8	134 1/4	134 3/8	134 1/2	134 5/8	134 3/4	134 7/8	135	135 1/8	135 1/4	135 3/8	135 1/2	135 5/8	135 3/4	135 7/8	136	136 1/8	136 1/4	136 3/8	136 1/2	136 5/8	136 3/4	136 7/8	137	137 1/8	137 1/4	137 3/8	137 1/2	137 5/8	137 3/4	137 7/8	138	138 1/8	138 1/4	138 3/8	138 1/2	138 5/8	138 3/4	138 7/8	139	139 1/8	139 1/4	139 3/8	139 1/2	139 5/8	139 3/4	139 7/8	140	140 1/8	140 1/4	140 3/8	140 1/2	140 5/8	140 3/4	140 7/8	141	141 1/8	141 1/4	141 3/8	141 1/2	141 5/8	141 3/4	141 7/8	142	142 1/8	142 1/4	142 3/8	142 1/2	142 5/8</
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CUT NO. 34. FLOOR  
BOXES.

## FLOOR BOXES.

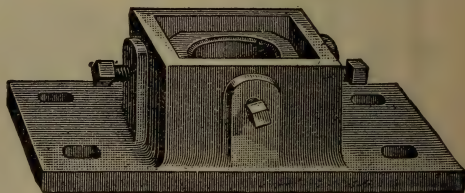
FOR PRICE LIST SEE PAGE 95.

For vertical shaft running through floor. They are furnished with babbitted, adjustable, self-oiling bearings, and are protected against dust by a casing.

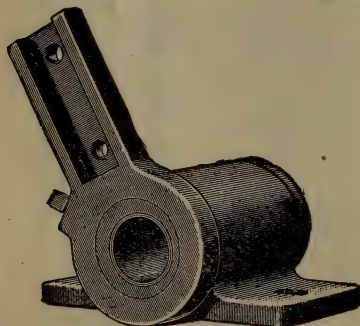
## STEP BOXES.

FOR PRICE LIST SEE PAGE 95.

These Boxes are used at the base of upright shafts, are adjustable, and are furnished with brass bearings.



CUT NO. 35. STEP BOXES



CUT NO. 36. ECCENTRIC BOX.

## ECCENTRIC BOX.

FOR PRICE LIST SEE PAGE 96.

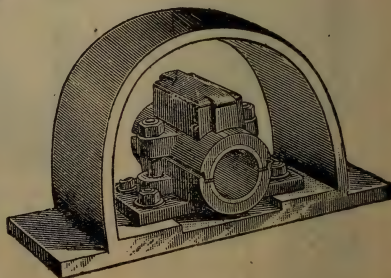
Used for engaging and disengaging friction gearing.

## WALL FRAMES.

FOR PRICE LIST SEE PAGE 95.

The price list is for the frames only. To arrive at the price complete, add price of Rigid Pillow Block or Ball and Socket Pillow Block, according to the style of bearing wanted.

We can furnish Wall Frames with base similar to base plate of Ball and Socket Pillow Block shown in cut No. 29, and will quote prices on application.



CUT NO. 37. WALL FRAME.

# **HAMMERING AND BORING BABBITTED BEARINGS OF HANGERS, FLOOR STANDS AND PILLOW BLOCKS.**

Diameter of Shaft.....	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Price per Bearing.....	\$1 10	1 20	1 30	1 40	1 60	1 80	2 10	2 40	2 80	3 30	3 80	4 80	4 80	5 30	5 90	6 30	6 80	7 20



## **FLOOR BOXES. ADJUSTABLE, SELF-OILING BABBITTED BEARINGS.**

SEE CUT NO. 34. DESCRIPTION ON PAGE 94.

Diameter of Shaft.....	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16
Cipher.....	Bronwell	Browning	Burkart	Cartwell	Carnack	Carpenter	Caruth	Cassidy	Caswell	Chadwick	Charters
Price.....	\$5 60	6 80	8 10	9 30	11 50	13 10	14 60	16 60	18 30	20 75	23 00



## **STEP BOXES. WITH BRASS JOURNAL BOXES.**

SEE CUT NO. 35. DESCRIPTION ON PAGE 94.

Diam. of Shaft.	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Cipher.....	Snider	Snow	Sontag	Souhard	Sowders	Spanish	Sparks	Spicer	Spiker	Spino	Sport	Spotts	Sprague	Spratt	Squiers		
Price.....	\$6 60	7 40	8 50	9 60	11 25	13 60	15 75	19 75	24 00	26 00	30 00	33 60	39 50	45 60	52 60		



## **WALL FRAMES. WITHOUT PILLOW BLOCK.**

SEE CUT NO. 37. DESCRIPTION ON PAGE 94.

Diameter of Shaft.	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Cipher.....	Vacate	Vacation	Vacilate	Vale	Vegetant	Vague	Vail	Vainly	Valance	Voderate	Valet	Valiant	Valdity	Valles	Valium	Valor	Valas	Valre
Price.....	\$4 00	4 60	5 00	5 60	6 60	7 60	8 80	10 25	11 75	12 75	13 75	15 60	16 60	17 60	18 75	20 00	22 75	25 00

Above prices are for Wall Frames 9 inches wide; for every additional inch add 8 per cent to List Prices.



## ECCENTRIC BOXES.

SEE CUT No. 36. DESCRIPTION ON PAGE 91.

Diameter of Shaft...	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16
Length of Bearing..	5	6 3/4	6 3/4	7 1/4	7 3/4	8 1/4	8 3/4	9 1/4
Cipher.....	Sancho	Sandach	Sandburg	Sanderson	Sandusky	Sankey	Sanwald	Sargent
Price .....	\$8 50	10 00	11 50	13 00	15 00	16 50	18 75	21 50

## SPECIAL FLOOR STANDS.



Without Pillow Blocks, but including Bolts to Fasten Pillow Blocks.

See pages 87 and 89 for prices of Pillow Blocks.  
SEE CUT No. 41. DESCRIPTION ON PAGE 97.

Diameter of Shaft.	Height to Center of Shaft.	CIPHER.	Price.	Diameter of Shaft.	Height to Center of Shaft.	CIPHER.	Price.
215/16	30	Canary	\$28 70	43/16	34	Captious	\$39 60
	32	Cancer	28 85		36	Captive	39 80
	34	Candid	29 00	47/16	38	Caracole	41 40
	36	Candock	29 15		40	Caravan	41 65
33/16	30	Canine	30 40		42	Carbine	41 95
	32	Cannibal	30 55		44	Carbonic	43 80
	34	Cantata	30 70	411/16	30	Carding	43 90
	36	Canteen	30 85		32	Career	44 10
37/16	30	Canticle	32 70		34	Caribou	44 89
	32	Cantlet	32 90		36	Caricous	44 50
	34	Canvasser	33 10	415/16	30	Cariole	45 60
	36	Canzonet	33 30		32	Carnival	45 85
311/16	30	Capacious	34 80		34	Carping	46 15
	32	Capellet	35 00		36	Carpolite	46 45
	34	Capering	35 20	57/16	30	Carriou	50 70
	36	Capillary	35 40		32	Cartilage	51 00
313/16	30	Capoch	36 50		34	Cartload	51 40
	32	Capon	37 00		36	Cartouch	51 80
	34	Capote	37 20	515/16	30	Cartrut	54 50
	36	Capper	37 40		32	Cartway	54 85
43/16	30	Caprice	39 20		34	Cashbox	55 15
	32	Capsario	39 40		36	Casemate	55 50

## FULCRUM STANDS.



PLAIN.



GEARED.

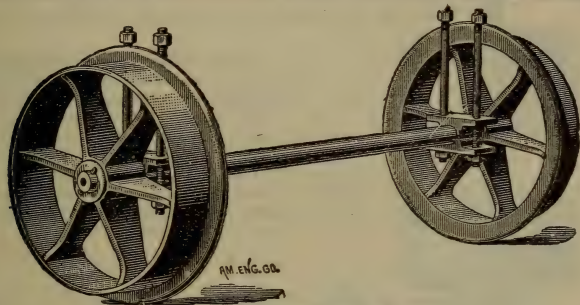
From Center of Shaft to Floor, inches.....		30	32	34	36
Plain.....	{ Cipher.....	Cimeter	Cipolin	Circle	Circuit
	{ Price.....	13 50	13 75	14 25	14 75
Geared...	{ Cipher.....	Circus	Citadel	Civility	Clacking
	{ Price.....	35 00	35 50	36 00	36 50



**LUMBER TRUCK WHEELS.**

FOR PRICE LIST SEE PAGE 99.

Our Lumber Truck Wheels are very strong. The price list includes four wheels, two axles, four boxes and eight bolts for 10-inch timbers. The wheels run loose on axle, and are



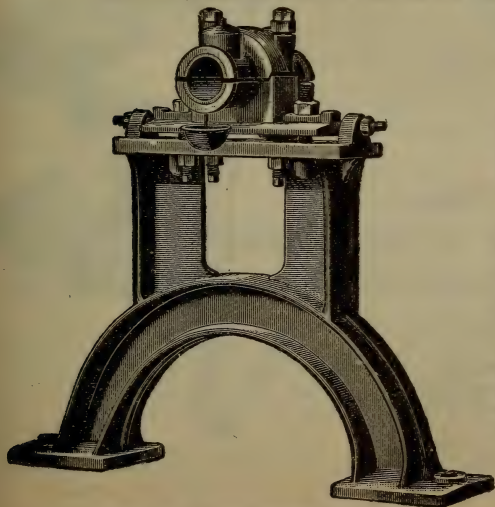
CUT NO. 40. LUMBER TRUCK WHEELS.

held in position by the boxes on inside, and the washers and cotter pin on the outside of wheels. The prices are based on 3-foot gauge track. When ordering give distance between tracks.

**SPECIAL FLOOR STANDS.**

FOR PRICE LIST OF STANDS SEE PAGE 96

FOR PRICE LIST OF PILLOW BLOCKS SEE PAGES 87 and 89.



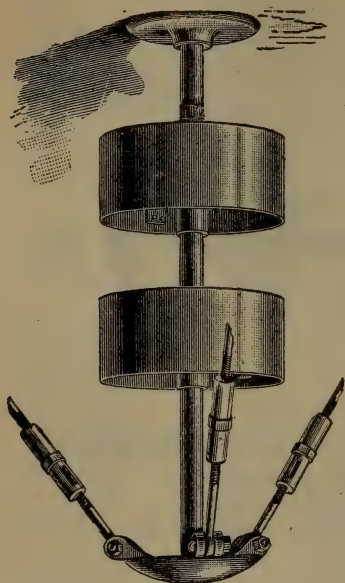
CUT NO. 41. ADJUSTABLE FLOOR STANDS.

We furnish these Stands arranged to use with Ring-Oiling Ball and Socket pillow blocks, Wick Oiling Ball and Socket-pillow blocks or rigid pillow blocks.

These Stands are made very strong, and are of graceful pattern, and are intended specially for heavy work.

They have a wide spread on the floor, and a large base which makes them very rigid.

We consider pillow blocks of the Ball and Socket type as best adapted for use with these Stands, as they adjust themselves to the shaft, and make it very easy to line up.



CUT NO. 39. MULE PULLEY STANDS.

## Universal Mule Pulley Stands.

Adjustable in Every Direction.

FOR PRICE LIST SEE PAGE 99.

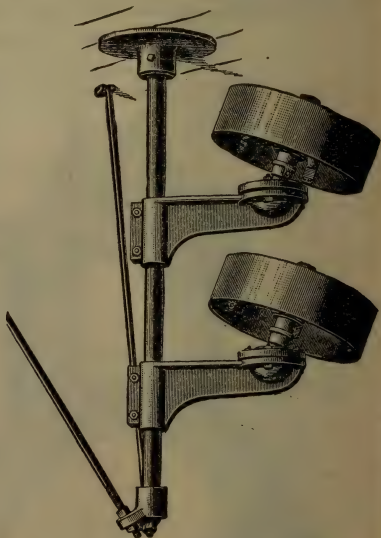
The shafts on which the mule pulleys run are fitted with a ball and socket on the lower end, which permits the shaft to be set at any angle and in any direction.

These stands can be used in connection with shafts which are not on the same plane.

## MULE PULLEY STANDS.

FOR PRICE LIST SEE PAGE 99.

A belt in connection with Mule Stand affords the best means of transmitting power from shaft to shaft which are at an angle with each other. We furnish these Mule Stands with any length of shaft and any size pulleys that may be wanted. The pulleys run loose on the shaft, and are provided with sleeves which give an extra long bearing to the pulley. These sleeves are the only part subject to wear and can be replaced at any time at a slight cost.



CUT NO 64. UNIVERSAL MULE PULLEY STANDS



## PLAIN MULE PULLEY STAND.

SEE CUT No. 89.

DESCRIPTION ON PAGE 98.

Width of Belt, Inches.	3	4	5	6	7	8	9	10	12
Diameter of Shaft.....	13/16	17/16	111/16	111/16	111/16	115/16	115/16	23/16	27/16
Diameter of Pulleys, In.	10	10	12	14	14	16	16	18	20
Cipher.....	Streck	Street	Studley	Sturges	Sullivan	Sunday	Swearer	Sweney	Swops
Price .....	\$25 50	28 50	34 00	38 00	40 00	46 00	48 00	55 00	72 00

Prices include one shaft 4 feet long, two pulleys with face 1 inch wider than belt, two sleeves, two set collars, top and bottom plates, and three guy rods.



## UNIVERSAL MULE STANDS.

SEE CUT No. 64.

DESCRIPTION ON PAGE 98.

Width of Belt.....	3	4	5	6	7	8	9	10	12
Diameter of Shaft.....	111/16	111/16	115/16	115/16	115/16	23/16	23/16	27/16	213/16
Size of Pulleys.....	10x4	10x5	12x5	14x7	14x8	16x9	16x10	18x11	20x13
Cipher.....	Comatose	Comely	Comma	Commons	Commate	Compact	Compare	Compeer	Comple
Price .....	\$46 00	47 00	57 00	62 00	64 00	76 00	80 00	92 00	112 00

Prices include one shaft 4 feet long, two pulleys, two sleeves, four sets collars, top and bottom plates and two guy rods.



## LUMBER TRUCK WHEELS.

SEE CUT No. 40. DESCRIPTION ON PAGE 97.

Diam. of Wheel.	10	12	14	16	18	20	24
Diameter of Axle	17/16	17/16	111/16	111/16	115/16	115/16	115/16
Cipher.....	Stacy	Stafford	Stalker	Stamps	Stanley	Stark	Strauss
Price.....	\$28 00	30 00	35 00	41 00	47 00	53 00	59 00

These wheels are very strong and run loose on axles. Prices include 4 wheels, 2 axles for track not over 3 feet gauge and 8 bolts for 10-inch timbers.

In ordering give distance between tracks.

L. of C.

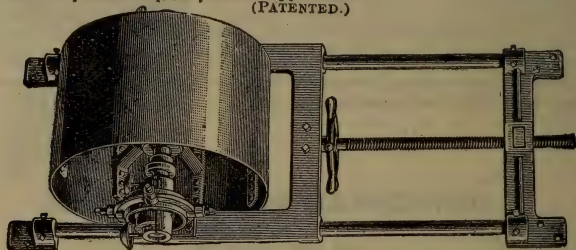
**BELT TIGHTENERS.**

FOR PRICE LIST SEE PAGE 101.

These tighteners are very simply and substantially constructed and are positive in action. They are supplied with self-oiling adjustable bearings, and are capable of the very nicest adjustment, as by using the adjusting screws which hold the boxes, the belt can be made to run exactly in the center of the pulley. These tighteners are in every way superior to the old style Rack and Pinion tightener. We have sold them for years, and they have given perfect satisfaction; we can not recommend them too highly.

We are prepared to furnish tighteners similar to our cut No. 38, except that they would be provided with flanges and guy rods by which they could be set vertically on floor or suspended from ceiling.

We will be pleased to quote prices on application.  
(PATENTED.)

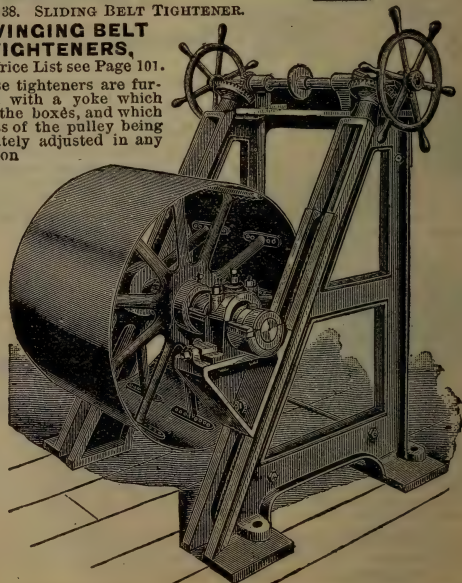


No. 38. SLIDING BELT TIGHTENER.

**SWINGING BELT TIGHTENERS,**

For Price List see Page 101.

These tighteners are furnished with a yoke which holds the boxes, and which permits of the pulley being accurately adjusted in any direction.

CUT No. 63.  
SWINGING BELT TIGHTENER.CUT No. 67. SPECIAL BELT TIGHTENER, FOR HEAVY WORK.  
For Price List, see Page 101.





## SLIDING BELT TIGHTENER.

Iron Frame, Adjustable—Complete with Double-Belt Pulley and Self-Oiling Babbitted Bearings

SEE CUT NO. 38. DESCRIPTION ON PAGE 100.

Number.....	1	2	3	4	5	6	7	8
Size of Pulley.....	12x9	14x11	18x13	20x17	24x21	30x25	36x31	40x37
Distance between Uprights, Inches.....	12	14	16	20	24	28	34	40
Length of Adjustment.....	20	22	24	26	30	34	40	46
Cipher.....	Slicer	Slick	Slinger	Sloss	Smelter	Smith	Sneed	
Price.....	\$49 00	54 00	70 00	80 00	112 00	145 00	197 00	270 00

Slight extra charge for variation in distance between Uprights, and in length of adjustment.



## SWINGING BELT TIGHTENER.

Iron Frame—Complete with Double-Belt Pulley and Adjustable Self-Oiling Bearings.

SEE CUT NO. 63. DESCRIPTION ON PAGE 100.

Width of Belt, Inches.....	4	6	8	10	12	16	20	24
Size of Pulley.....	10x5	10x7	12x9	14x11	18x13	20x17	24x21	30x25
Cipher.....	Chamber	Clashing	Clawing	Clearage	Cleft	Clergy	Clifty	Climate
Length of Frame, 3 Feet.....	\$29 00	30 00	36 00	40 00	63 00	65 00	88 00	120 00
Cipher.....	Clinker	Clique	Clock	Cloddy	Clotted	Clorlag	Clumper	Clumsy
Length of Frame, 4 Feet.....	\$31 00	32 00	39 00	43 00	67 00	69 00	95 00	127 00
Cipher.....	Coach	Coatbox	Coarsely	Cobbler	Cobweb	Cockade	Cockpit	Codfish
Length of Frame, 5 Feet.....	\$33 00	34 00	42 00	46 00	61 00	73 00	102 00	134 00
Cipher.....	Todger	Cogancy	Cognate	Coherent	Cohort	Collapse	Collector	
Length of Frame, 6 Feet.....	\$35 00	36 00	45 00	49 00	66 00	77 00	109 00	141 00



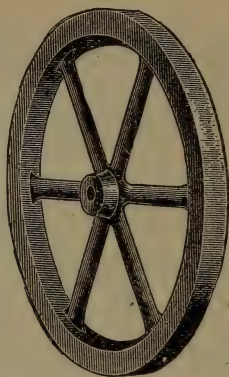
## SPECIAL BELT TIGHTENER.—FOR HEAVY WORK.

Iron Frame—Complete with Pulley for Triple-Belt Strain and Ring-Oiling Bearings.

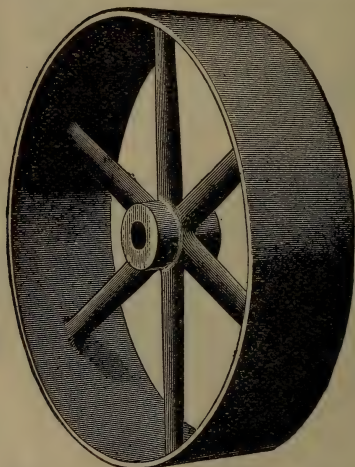
SEE CUT NO. 67. PAGE 100.

Width of Belt, Inches.....	20	22	24	30	36	42	48
Cipher.....	Dabbler.	Daddy.	Dahila.	Dangle.	Dapper.	Dative.	Dazle.
Price.....	\$370 00	\$380 00	\$400 00	\$465 00	\$570 00	\$760 00	\$760 30

These prices are for Belt Tighteners made so that the top of Pulley extends 4 feet 8 inches above the floor, but we will make special prices for any height desired. It is desirable to send us a sketch showing distance between centres, and sizes of driving and driven pulleys; also floor line in relation to centres of Pulleys.



**FLY WHEEL.**

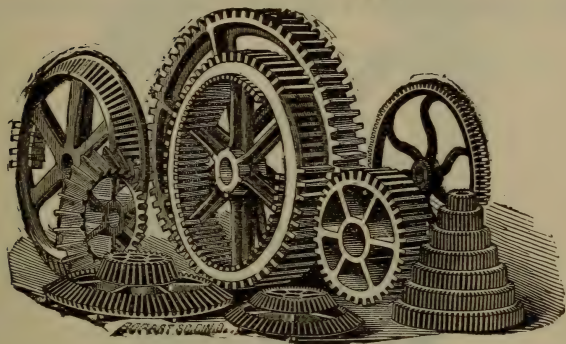


**FLY WHEEL PULLEY.**

**COVERED PULLEYS.**

We are prepared to cover the face of Pulleys with Rubber Belting of Leather, at reasonable prices.

## MILL GEARING.



SPUR, BEVEL AND MITER GEAR,  
BEVEL MORTISE and PINIONS IN PAIRS  
and SPUR MORTISE GEARS.

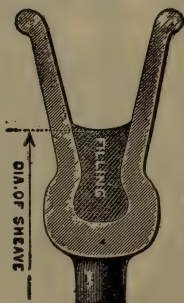
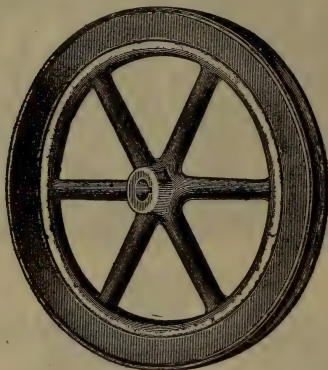
RATCHET WHEELS AND RACKS,  
CUT GEARING.

PRICES ON APPLICATION.

## WIRE ROPE SHEAVES.

RUBBER LINED OR WOOD LINED GROOVES FOR TRANSMISSION.

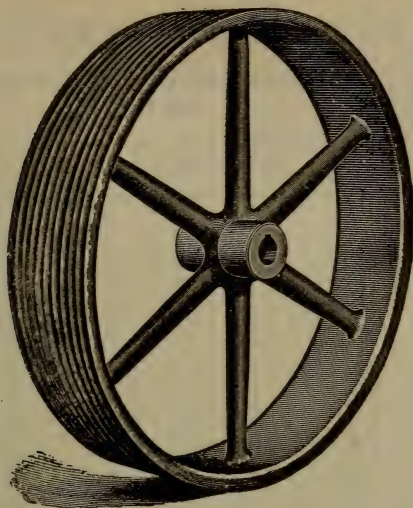
TURNT GROOVE SHEAVES FOR HOISTING.



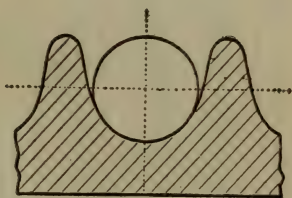
SECTION OF RUBBER LINED SHEAVES.

PRICES ON APPLICATION.





Form of Groove for Transmission.



Form of Groove for Idler.

## ROPE DRIVE SHEAVES.

Our sheaves are constructed in accordance with the latest and most approved practice, with arms proportioned suitably for their duty, and grooves of form calculated to transmit the greatest power without wedging.

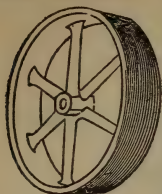
We make machine-moulded sheaves up to 72-inch diameter, which insures a uniformity of work not to be obtained in any other way.

We furnish sheaves either whole or split.

We list sheaves up to 120-inch diameter, but are prepared to quote on larger sizes on application, and are prepared to make plans and furnish estimates on this class of work.

In rope transmission with continuous rope drive of more than one rope it is necessary to have an idler or tension sheave, of which we list three styles.

We are prepared to furnish estimates on any style tension required for special locations.



# ROPE DRIVE SHEAVES—Whole.

Turned, Bored, and Keyseated or  
Set Screwed.

For additional Prices for Split Sheaves see page 105.

For Description and Cut see page 112.

Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.		
		$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{16}$ " to $1\frac{3}{4}$ " Rope.			$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{16}$ " to $1\frac{3}{4}$ " Rope.			$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{16}$ " to $1\frac{3}{4}$ " Rope.
13	1	9	10	12	20	3	23	26	31	24	13	83	98	114
	2	12	14	16		4	28	32	38		14	88	105	122
	3	15	18	20		5	33	37	44		15	94	112	130
	4	18	21	25		6	37	42	51		16	100	120	140
	5	21	25	29		7	42	47	58		17	106	127	150
	6	24	28	33		8	47	52	63		18	113	135	160
	7	27	32	37		9	52	57	69		19	120	143	170
	8	29	35	41		10	57	62	74		20	126	151	180
	9	32	38	45		11	62	68	81		21	133	159	190
	10	35	42	49		12	68	74	88		22	140	169	200
	11	38	46	54		13	73	80	94		23	147	177	210
	12	41	49	59		14	79	86	101		24	154	186	220
14	1	10	11	13		15	84	91	106		25	161	195	230
	2	13	15	18		16	90	97	113		26	168	204	240
	3	17	20	23		17	96	103	120		27	175	213	250
	4	20	24	28		18	102	110	128		28	182	222	260
	5	24	28	33		19	108	116	135		29	189	231	270
	6	27	32	37		20	114	122	142		30	196	240	280
	7	30	36	42		21	120	129	150		31	203	249	290
	8	33	40	47		22	126	136	157		32	210	258	300
	9	37	44	52		1	14	16	19		33	217	267	310
	10	40	49	58		2	19	22	26		34	224	276	320
	11	44	53	63		3	24	28	33		35	231	285	330
	12	48	57	68		4	29	34	40		36	238	294	340
16	1	14	16	19		5	34	41	48		37	245	303	350
	2	18	22	26		6	39	47	55		38	252	312	360
	3	22	27	31		7	44	52	62		39	259	321	370
	4	26	31	36		8	49	58	69		40	266	330	380
	5	30	36	42		9	55	64	76		41	273	339	390
	6	34	40	47		10	60	70	83		42	280	348	400
	7	38	45	53		11	66	77	91		43	287	357	410
	8	42	50	59		12	71	82	97		44	294	366	420
	9	46	54	64		13	77	88	103		45	301	375	430
	10	50	59	69		14	82	94	110		46	308	384	440
	11	54	64	75		15	88	100	117		47	315	393	450
	12	58	69	81		16	94	106	124		48	322	402	460
18	1	12	14	16		17	101	113	131		49	329	411	470
	2	16	19	22		18	107	120	139		50	336	420	480
	3	21	25	28		19	114	127	147		51	343	429	490
	4	25	29	34		20	120	134	155		52	350	438	500
	5	30	35	40		21	126	141	162		53	357	447	510
	6	34	40	47		22	132	147	169		54	364	456	520
	7	39	45	53		1	15	17	20		55	371	465	530
	8	43	50	59		2	20	24	27		56	378	474	540
	9	48	56	66		3	26	30	35		57	385	483	550
	10	52	61	72		4	32	37	43		58	392	492	560
	11	57	67	78		5	38	43	50		59	400	501	570
	12	61	73	84		6	43	50	58		60	407	510	580
20	1	13	15	17		7	48	56	65		61	414	519	590
	2	18	20	24		8	53	62	72		62	421	528	600
						9	59	70	81		63	428	537	610
						10	64	76	88		64	435	546	620
						11	70	83	97		65	442	555	630
						12	76	90	105		66	449	564	640

For additional Prices for Split Sheaves see page 112.

PRICE.					PRICE.					PRICE.				
Diameter.	Grooves.	1/2" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 3/8" to 1 3/4" Rope.	Diameter.	Grooves.	1/2" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 3/8" to 1 3/4" Rope.	Diameter.	Grooves.	1/2" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 3/8" to 1 3/4" Rope.
30	3	31	37	43	36	5	52	64	74	42	7	80	96	113
	4	37	44	52		6	61	74	86		8	89	107	126
	5	44	52	61		7	69	83	97		9	99	119	139
	6	50	60	70		8	77	93	109		10	108	130	152
	7	57	68	80		9	85	103	120		11	119	143	168
	8	63	76	89		10	93	112	132		12	130	157	184
	9	70	84	98		11	103	124	145		13	141	170	200
	10	77	92	107		12	112	135	158		14	152	183	216
	11	84	101	118		13	121	147	171		15	163	197	232
	12	92	110	129		14	131	158	184		16	174	211	248
	13	99	116	140		15	140	170	198		17	186	225	265
	14	107	128	151		16	150	182	212		18	198	239	281
	15	114	137	162		17	161	195	226		19	209	253	298
	16	122	147	173		18	171	207	241		20	221	268	315
	17	131	157	185		19	182	220	255		44	1	27	32
	18	139	167	197		20	192	233	270		2	37	45	52
	19	147	177	209		21	203	245	282		3	46	56	65
	20	155	187	221		22	213	257	294		4	55	67	78
32	1	19	23	27	38	1	23	27	32		5	65	78	91
	2	26	31	36		2	31	37	44		6	74	90	105
	3	33	39	46		3	40	47	55		7	84	101	119
	4	40	48	56		4	48	57	67		8	94	113	132
	5	47	56	65		5	56	68	79		9	103	124	145
	6	54	64	75		6	65	78	91		10	113	136	160
	7	61	73	85		7	73	88	103		11	124	150	176
	8	67	81	95		8	82	98	115		12	136	164	193
	9	74	89	104		9	90	108	126		13	148	178	209
	10	81	97	114		10	99	118	138		14	159	192	226
	11	89	107	126		11	108	130	152		15	171	207	243
	12	97	117	138		12	118	142	166		16	183	221	260
	13	105	126	150		13	128	154	180		17	195	236	278
	14	113	136	162		14	137	166	195		18	207	251	295
	15	121	145	174		15	147	178	209		19	219	266	313
	16	130	156	186		16	157	190	224		20	231	281	331
	17	139	167	199		17	168	203	239		40	1	29	34
	18	148	178	211		18	179	216	254		2	39	46	55
	19	156	189	224		19	189	229	269		3	49	59	69
	20	165	200	237		20	200	242	285		4	59	71	83
34	1	20	24	28	40	1	24	29	33		5	69	82	97
	2	28	33	39		2	33	39	46		6	79	94	111
	3	35	42	49		3	42	50	59		7	88	106	125
	4	42	50	59		4	51	61	71		8	98	117	139
	5	49	59	70		5	59	71	83		9	108	129	153
	6	57	68	80		6	68	82	96		10	118	142	167
	7	64	77	90		7	77	93	108		11	130	157	184
	8	71	85	100		8	86	104	121		12	142	171	202
	9	78	94	110		9	94	114	133		13	154	186	219
	10	85	103	121		10	103	125	146		14	166	201	236
	11	94	113	134		11	114	138	161		15	178	216	254
	12	102	123	147		12	124	150	176		16	191	231	272
	13	111	133	160		13	134	163	191		17	204	247	291
	14	119	143	173		14	145	175	206		18	217	262	309
	15	128	154	186		15	155	188	221		19	229	278	328
	16	137	165	199		16	166	201	236		20	242	294	347
	17	147	177	212		17	177	214	252		48	1	30	36
	18	156	188	226		18	188	228	268		2	40	51	58
	19	166	200	239		19	199	241	284		3	51	62	73
	20	175	212	253		20	210	255	300		4	61	74	87
36	1	22	26	30	42	1	26	30	35		5	71	86	102
	2	29	35	41		2	35	42	49		6	82	98	116
	3	37	45	52		3	44	52	62		7	92	111	130
	4	45	54	63		4	53	63	74		8	102	123	145
						5	62	74	87					
						6	71	85	100					

For additional Prices for Split Sheaves see page 112.



Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.		
		$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{8}$ " to $1\frac{7}{8}$ " Rope.			$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{8}$ " to $1\frac{7}{8}$ " Rope.			$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{16}$ " to $1\frac{1}{2}$ " Rope.	$1\frac{5}{8}$ " to $1\frac{7}{8}$ " Rope.
48	9	113 00	136 10	159 60	54	11	151 90	183 10	215 80	60	13	199 90	242 00	286 40
	10	123 30	148 50	174 00		12	166 20	200 60	236 60		14	216 20	262 00	310 20
	11	136 00	164 00	192 20		13	180 50	218 10	257 40		15	232 50	282 00	334 00
	12	148 70	179 50	210 40		14	194 80	235 60	278 20		16	248 00	301 00	355 60
	13	161 40	195 00	228 60		15	209 10	253 00	299 00		17	263 50	320 00	377 20
	14	174 10	210 50	246 80		16	223 10	269 60	319 60		18	279 00	339 00	398 80
	15	186 80	226 00	265 00		17	237 10	286 20	340 20		19	294 50	358 00	420 40
	16	200 00	242 20	284 60		18	251 10	302 80	360 80		20	310 00	377 00	442 00
	17	213 20	258 40	304 20		19	265 10	319 40	381 40		62	1	47 10	58 00
	18	226 40	274 60	323 80		20	279 10	338 00	402 00			2	58 10	73 20
	19	239 60	290 80	343 40		56	1	39 60	48 40			3	69 10	87 10
	20	252 80	307 00	363 00			2	51 20	63 60			4	80 10	101 10
50	1	32 10	38 80	45 20			3	62 80	76 90			5	92 00	113 90
	2	43 30	54 03	61 90			4	74 40	90 20			6	105 10	130 00
	3	54 50	67 00	77 60			5	86 00	103 50			7	119 10	146 00
	4	65 70	79 90	93 30			6	97 30	117 10			8	133 10	162 00
	5	76 90	92 80	109 00			7	108 60	130 70			9	147 10	178 00
	6	87 10	105 10	123 40			8	119 90	144 30			10	161 10	194 00
	7	97 30	117 40	137 80			9	131 20	157 90			11	178 70	215 60
	8	107 50	129 60	152 20			10	142 50	171 50			12	196 30	237 20
	9	117 70	141 80	166 60			11	157 40	189 80			13	213 90	258 80
	10	127 90	154 00	181 00			12	172 30	208 10			14	231 50	280 40
	11	141 20	170 20	200 00			13	187 20	226 40			15	249 10	302 00
	12	154 50	186 40	219 00			14	202 10	244 70			16	266 20	322 80
	13	167 80	202 60	238 00			15	217 00	263 00			17	283 30	343 60
	14	181 10	218 80	257 00			16	231 40	280 60			18	300 40	364 40
	15	194 40	235 00	276 00			17	245 80	298 20			19	317 50	385 20
	16	203 20	252 00	296 00			18	260 20	315 80			20	334 60	406 00
	17	222 00	269 00	316 00		58	19	274 60	333 40		64	1	49 60	61 20
	18	235 80	286 00	336 00			20	289 00	351 00			2	61 80	76 40
	19	249 60	303 00	356 00			1	42 10	51 60			3	74 00	90 60
	20	263 40	320 00	376 00			2	53 70	66 80			4	86 20	104 80
52	1	34 60	42 00	48 50			3	65 30	80 20			5	98 40	119 00
	2	46 00	57 20	65 10			4	76 90	93 60			6	112 20	135 60
	3	57 40	70 50	81 00			5	88 50	107 00			7	126 00	152 20
	4	68 80	83 70	97 00			6	100 30	121 00			8	139 80	168 80
	5	80 20	96 90	113 00			7	112 10	135 00			9	153 60	185 40
	6	90 80	109 50	128 00			8	123 90	149 00			10	167 40	202 00
	7	101 40	122 10	143 00			9	135 70	163 00			11	185 60	224 20
	8	112 00	134 60	158 00			10	147 50	177 00			12	203 80	246 40
	9	122 60	147 20	173 00			11	162 90	196 00			13	222 00	268 60
	10	133 20	159 80	188 00			12	175 30	215 00			14	240 20	290 80
	11	144 90	176 70	208 00			13	193 70	234 00			15	258 40	313 00
	12	160 60	193 60	228 00			14	209 10	253 00			16	275 70	334 40
	13	174 30	210 40	248 00			15	224 50	272 00			17	293 00	355 80
	14	188 00	227 20	268 00			16	239 40	290 40			18	310 30	377 20
	15	201 70	244 00	288 00			17	254 30	308 50			19	327 60	398 60
	16	216 20	261 20	308 20			18	269 20	327 20			20	344 90	420 00
	17	230 70	278 40	328 40		60	19	284 10	345 60		66	1	52 10	64 40
	18	245 20	295 60	348 60			20	299 00	364 00			2	65 00	79 40
	19	259 70	312 80	368 80			1	44 60	54 80			3	77 90	94 70
	20	274 20	330 00	389 00			2	56 20	70 00			4	90 80	109 80
54	1	37 10	45 20	51 80			3	67 80	83 40			5	103 70	124 80
	2	48 60	60 40	68 30			4	79 40	96 50			6	117 90	142 00
	3	60 10	73 60	84 90			5	90 00	110 20			7	132 10	159 00
	4	71 60	86 80	101 40			6	103 00	124 60			8	146 30	176 00
	5	83 10	100 00	115 60			7	115 00	139 00			9	160 50	193 00
	6	94 00	113 20	133 40			8	127 00	153 40			10	174 70	210 00
	7	104 90	126 30	148 50			9	139 00	167 70			11	192 40	231 80
	8	115 80	139 40	164 20			10	151 00	182 00			12	210 10	253 60
	9	126 70	152 50	179 60			11		169 30	202 00			13	227 80		275 40
	10	137 60	165 60	195 00			12		183 60	222 00			14	245 50		297 20

For additional Prices for Split Sheaves see page 112.



PRICE.				PRICE.				PRICE.			
Diameter.	Grooves.	$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{8}$ " to $1\frac{1}{2}$ " Rope.	Diameter.	Grooves.	$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{8}$ " to $1\frac{1}{2}$ " Rope.	Diameter.	Grooves.	$\frac{3}{8}$ " to 1" Rope.	$1\frac{1}{8}$ " to $1\frac{1}{2}$ " Rope.
66	15	261	319	72	17	329	400	78	19	411	499
	16	282	344		18	348	423		20	431	524
	17	301	365		19	368	446		1	77	92
	18	340	389		20	387	472		2	95	119
	19	340	412		1	65	79		3	116	140
	20	359	435		2	81	99		4	132	161
	1	54	67		3	97	118		5	151	182
	2	65	82		4	113	137		6	169	204
	3	81	98		5	130	156		7	187	225
	4	95	115		6	146	175		8	205	247
	5	108	131		7	161	195		9	223	269
	6	124	149		8	177	214		10	241	291
	7	140	163		9	193	233		11	261	315
	8	156	187		10	209	253		12	281	340
	9	172	206		11	228	276		13	301	364
	68	10	188		225	12	247		299	14	321	389
11		205	246	13	266	322	15	341	414		
12		221	267	14	285	345	16	362	439		
13		238	288	15	304	368	17	383	465		
14		255	303	16	323	392	18	404	490		
15		272	330	17	343	416	19	425	516		
16		292	351	18	363	440	20	446	542		
17		312	376	19	382	464	1	81	97		
18		332	402	20	402	488	2	104	126		
19		351	426	1	69	83	3	122	147		
20		371	450	2	86	105	4	140	169		
1		57	70	3	103	125	5	158	191		
2		72	86	4	119	144	6	177	214		
3		87	104	5	136	164	7	196	236		
4		102	123	6	153	184	8	215	259		
70		5	117	142	7	170	205	9	234	282	
	6	133	160	8	186	225	10	253	305		
	7	149	179	9	204	245	11	273	330		
	8	164	197	10	221	266	12	294	355		
	9	179	216	11	240	289	13	314	380		
	10	195	235	12	259	313	14	335	406		
	11	213	257	13	278	336	15	356	431		
	12	232	280	14	298	360	16	377	457		
	13	250	302	15	317	384	17	398	482		
	14	269	325	16	337	408	18	419	508		
	15	287	348	17	357	433	19	440	534		
	16	305	369	18	377	457	20	461	560		
	17	323	391	19	397	482	1	85	102		
	18	341	413	20	417	506	2	110	132		
	19	358	435	1	73	88	3	128	155		
	20	376	460	2	92	112	4	146	177		
72	1	61	74	74	3	109	133	80	5	165	199
	2	77	92		4	126	153		6	185	223
	3	93	111		5	143	173		7	205	247
	4	108	129		6	161	194		8	225	271
	5	123	145		7	178	215		9	245	295
	6	138	166		8	196	236		10	265	320
	7	153	184		9	213	257		11	285	345
	8	168	202		10	231	278		12	306	370
	9	183	220		11	251	302		13	327	396
	10	198	239		12	270	326		14	347	421
	11	216	262		13	290	351		15	368	447
	12	235	285		14	310	375		16	389	471
	13	253	308		15	329	400		17	411	496
	14	272	331		16	350	424		18	432	520
	15	291	354		17	370	449		19	454	545
	16	310	377		18	391	474		20	475	572

Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.		
		3/4" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 5/8" to 1 3/4" Rope.			3/4" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 5/8" to 1 3/4" Rope.			3/4" to 1" Rope.	1 1/8" to 1 1/2" Rope.	1 5/8" to 1 3/4" Rope.
86	1	89 00	106 50	120 60	92	3	157 00	189 40	219 20	98	5	226 80	273 40	319 00
	2	116 70	139 50	160 00		4	180 00	218 30	253 10		6	249 00	301 00	351 40
	3	136 00	162 70	187 00		5	203 00	247 00	287 00		7	293 40	348 50	398 80
	4	155 30	185 90	214 00		6	223 80	272 20	316 40		8	315 60	376 00	426 20
	5	174 80	209 00	241 00		7	244 60	297 40	345 80		9	337 80	401 00	451 00
	6	194 70	233 60	269 00		8	265 40	322 60	375 20		10	360 10	438 00	512 20
	7	214 80	258 20	293 00		9	286 20	347 80	404 60		11	384 40	465 00	543 40
	8	234 90	282 80	328 00		10	307 00	373 00	434 00		12	404 70	492 00	574 00
	9	255 00	307 40	357 00		11	327 00	398 40	465 00		13	427 00	519 00	605 80
	10	275 10	332 00	386 00		12	345 80	423 80	496 00		14	449 30	546 00	637 00
	11	296 40	353 00	416 20		13	369 70	449 20	527 00		15	470 00	572 00	667 00
	12	317 70	384 00	446 40		14	390 60	474 60	558 00		16	491 00	598 00	698 20
	13	339 00	410 00	476 60		15	411 50	500 00	589 00		17	512 00	624 00	725 80
	14	360 30	436 00	506 80		16	433 80	526 80	619 00		18	533 00	650 00	759 40
	15	381 60	462 00	537 00		17	456 10	553 60	649 00		19	556 00	679 00	790 00
	16	401 30	485 60	566 80		18	478 40	580 40	679 00		20	579 00	700 00	816 00
	17	421 00	509 20	596 60		19	500 70	607 20	709 00	100	1	120 00	143 00	166 00
	18	440 70	532 80	626 40		20	523 00	634 00	739 00		2	156 90	188 70	219 60
	19	460 40	556 40	656 20	94	1	105 00	124 50	143 30		3	182 00	219 90	256 10
	20	480 10	584 00	686 00		2	139 80	167 50	193 60		4	207 10	251 00	292 60
88	1	93 00	111 00	126 20		3	163 40	197 00	228 40		5	232 20	282 00	330 00
	2	122 70	146 50	163 40		4	187 00	226 50	263 20		6	255 00	310 00	362 00
	3	144 50	173 20	200 00		5	210 60	256 00	298 00		7	278 00	338 00	395 00
	4	166 30	199 90	231 50		6	232 10	282 20	328 40		8	301 00	366 00	428 00
	5	188 10	226 50	263 00		7	253 66	308 40	358 80		9	324 00	394 00	461 00
	6	207 50	250 40	290 80		8	275 10	334 60	389 20		10	347 00	422 00	494 00
	7	226 80	274 30	318 60		9	296 60	360 80	419 60		11	369 40	449 60	525 80
	8	246 10	298 20	346 40		10	318 10	387 00	450 00		12	391 80	477 20	557 00
	9	265 40	322 10	374 20		11	339 50	412 80	481 60		13	414 20	504 80	589 40
	10	284 70	346 00	402 00		12	360 90	438 60	512 00		14	436 60	532 40	621 20
	11	305 10	370 60	432 60		13	382 30	464 40	543 00		15	459 00	560 00	653 00
	12	325 50	395 20	463 20		14	403 70	490 20	574 00		16	481 00	586 40	683 80
	13	345 90	419 80	493 80		15	425 10	516 00	605 00		17	503 00	612 80	714 60
	14	366 30	444 40	524 40		16	447 60	542 80	635 20		18	525 00	639 20	745 40
	15	386 70	469 00	555 00		17	470 10	569 60	665 40		19	547 00	665 60	776 20
	16	408 10	494 80	584 80		18	492 60	596 40	695 60		20	569 00	692 00	807 00
	17	429 50	520 60	614 60		19	515 10	623 20	725 80	102	1	125 50	150 00	174 60
	18	450 90	546 40	644 40		20	537 60	650 00	756 00		2	162 60	195 80	228 40
	19	472 30	572 20	674 20	96	1	109 00	129 00	149 00		3	188 20	227 20	265 30
	20	493 70	598 00	704 00		2	145 50	174 50	202 00		4	213 80	258 60	302 30
90	1	97 00	115 50	131 90		3	170 00	204 70	237 70		5	239 40	290 00	339 00
	2	128 40	153 50	176 80		4	194 50	234 90	273 40		6	262 60	318 40	372 40
	3	150 80	181 50	209 60		5	219 00	265 00	309 00		7	285 80	346 80	405 80
	4	173 20	209 50	242 30		6	241 00	292 00	340 40		8	309 00	375 20	439 20
	5	195 60	237 40	275 00		7	263 00	319 00	371 60		9	332 20	403 60	474 00
	6	215 80	262 00	303 60		8	285 00	346 00	403 20		10	355 40	432 00	506 00
	7	236 00	286 50	332 20		9	307 00	373 00	434 60		11	378 90	460 60	538 20
	8	256 20	311 00	360 80		10	329 00	400 00	466 00		12	402 40	489 20	570 40
	9	276 40	335 50	389 40		11	350 60	426 40	497 00		13	425 90	517 80	602 00
	10	296 60	360 00	418 00		12	372 20	452 80	528 00		14	449 40	546 40	634 80
	11	317 20	385 00	448 80		13	393 80	479 20	559 00		15	472 90	575 00	667 00
	12	337 80	410 00	479 60		14	415 40	505 60	590 00		16	495 10	602 00	699 30
	13	358 40	435 00	510 40		15	437 00	532 00	621 00		17	517 30	629 00	731 40
	14	379 00	460 00	541 20		16	459 80	559 20	651 40		18	539 50	656 00	763 60
	15	399 60	485 00	572 00		17	482 60	586 40	681 80		19	561 70	683 00	795 80
	16	421 30	511 40	602 00		18	505 40	613 60	712 20		20	583 90	710 00	828 00
	17	443 00	537 80	632 00	98	19	528 20	640 80	742 60		1	131 00	157 00	183 20
	18	464 70	564 20	662 00		20	551 00	668 00	773 00		2	168 30	202 90	237 20
	19	486 40	590 60	692 00		1	114 50	136 00	157 50		3	194 00	234 60	274 50
	20	508 10	616 00	722 00		2	151 20	181 60	210 80		4	219 70	266 30	311 80
92	1	101 00	120 00	137 60		3	176 40	212 20	246 90		5	245 40	298 00	349 00
	2	134 10	160 50	185 20		4	201 60	242 80	283 00		6	269 40	327 00	382 80

For additional Prices for Split Sheaves see page 112.

Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.			Diameter.	Grooves.	PRICE.		
		¾" to 1" Rope.	1 1/16" to 1 1/8" Rope.	1 5/16" to 1 1/2" Rope.			¾" to 1" Rope.	1 1/16" to 1 1/8" Rope.	1 5/16" to 1 1/2" Rope.			¾" to 1" Rope.	1 1/16" to 1 1/8" Rope.	1 5/16" to 1 1/2" Rope.
104	2	293 40	356 00	416 60	110	5	266 00	323 00	379 00	116	3	234 00	284 00	333 50
	3	317 40	385 00	450 40		6	289 50	351 60	413 40		4	265 00	321 60	377 80
	9	341 40	414 00	484 20		7	313 00	380 20	447 80		5	290 00	350 00	422 00
	10	365 40	443 00	518 00		8	336 50	408 80	482 20		6	318 00	386 00	454 40
	11	389 00	472 40	550 60		9	360 00	437 40	516 60		7	341 00	414 20	486 80
	12	413 00	501 80	581 20		10	383 50	466 00	551 00		8	364 00	441 80	519 20
	13	437 00	531 20	615 80		11	409 00	496 60	585 40		9	387 00	469 40	551 60
	14	461 00	560 60	646 40		12	434 00	527 20	619 50		10	410 00	497 00	584 00
	15	485 00	590 00	681 00		13	459 00	557 80	654 20		11	436 00	530 00	622 00
	16	507 00	617 60	714 40		14	484 00	588 40	688 60		12	463 00	563 00	660 00
	17	530 20	645 20	747 80		15	509 00	619 00	723 00		13	489 00	596 00	698 00
	18	552 80	672 80	781 20		16	535 50	651 60	760 80		14	516 00	629 00	736 00
	19	575 40	700 40	814 60		17	562 00	684 20	798 60		15	543 00	662 00	774 00
	20	598 00	728 00	849 00		18	588 50	716 80	836 40		16	572 00	697 00	814 20
106	1	136 50	164 00	191 80		19	615 00	749 40	874 20		17	601 00	732 00	854 40
	2	174 00	210 00	246 00		20	641 50	782 00	912 00		18	630 00	767 00	894 60
	3	200 00	242 00	283 70	112	1	153 00	185 00	217 60		19	659 00	802 00	934 80
	4	226 00	274 00	321 00		2	191 10	232 00	272 40		20	688 00	837 00	975 00
	5	252 00	306 00	359 00		3	221 00	268 70	315 00		1	171 00	206 00	243 40
	6	276 30	335 60	393 00		4	251 00	305 40	357 50	118	2	209 00	253 60	297 60
	7	300 60	365 20	427 00		5	281 00	342 00	400 00		3	240 00	291 80	342 80
	8	324 90	394 80	461 00		6	303 00	368 80	432 40		4	271 00	330 00	388 00
	9	349 20	424 40	495 00		7	325 00	395 60	464 80		5	302 00	368 00	433 00
	10	373 50	454 00	529 00		8	347 00	422 40	497 20		6	326 00	395 80	465 40
	11	398 00	482 20	562 20		9	369 00	449 20	520 60		7	350 00	423 60	497 80
	12	418 50	510 40	595 40		10	392 00	476 00	562 00		8	373 00	451 40	530 20
	13	441 00	538 60	623 60		11	417 50	507 40	597 60		9	396 00	479 20	562 60
	14	463 50	566 80	661 80		12	443 00	538 80	633 20		10	419 00	507 00	595 00
	15	487 00	595 00	695 00		13	468 50	570 20	668 80		11	446 00	540 80	634 20
	16	511 20	625 00	730 00		14	494 00	601 60	704 40		12	473 00	574 60	673 40
	17	536 40	655 00	765 00		15	520 00	633 00	740 00		13	500 00	608 40	712 60
	18	561 60	685 00	800 00		16	547 00	666 40	778 60		14	528 00	642 20	751 80
	19	586 80	715 00	835 00		17	574 00	699 80	817 20		15	556 00	676 00	791 00
	20	612 00	745 00	870 00		18	601 00	733 20	855 80		16	585 00	711 60	832 00
108	1	142 00	171 00	200 40		19	629 00	766 60	894 40		17	614 00	747 20	873 00
	2	179 70	217 10	255 00		20	657 00	800 00	933 00		18	643 00	782 80	914 00
	3	206 50	249 80	293 00	114	1	159 00	192 00	226 20		19	672 00	818 40	955 00
	4	233 30	282 50	331 00		2	197 00	239 20	280 80		20	701 00	854 00	996 00
	5	260 00	315 00	369 00		3	227 00	276 20	324 00		1	177 00	213 00	252 00
	6	284 50	344 60	403 20		4	257 00	313 20	367 00	120	2	215 00	260 80	308 00
	7	309 00	374 20	437 40		5	288 00	350 00	410 00		3	247 00	299 60	353 40
	8	333 50	403 80	471 60		6	311 00	377 40	442 60		4	278 00	338 40	398 70
	9	358 00	433 40	505 80		7	333 00	404 80	475 20		5	309 00	377 00	444 00
	10	382 50	463 00	540 00		8	355 00	432 20	507 80		6	333 00	405 00	476 40
	11	405 50	491 60	573 80		9	377 00	459 60	540 40		7	357 00	433 00	508 80
	12	428 50	520 20	607 60		10	400 00	487 00	573 00		8	381 00	461 00	541 20
	13	451 50	548 80	641 40		11	426 50	519 20	609 80		9	404 00	489 00	573 60
	14	474 50	577 40	675 20		12	453 00	551 40	646 60		10	427 00	518 00	606 00
	15	497 50	606 00	709 00		13	479 50	583 60	683 40		11	455 00	552 40	646 40
	16	523 00	637 60	745 40		14	506 00	615 80	720 20		12	483 00	586 80	686 80
	17	549 00	669 20	781 80		15	532 50	648 00	757 00		13	511 00	621 20	727 20
	18	575 00	700 80	818 20		16	560 00	682 00	796 40		14	539 00	655 60	767 60
	19	601 00	732 40	854 60		17	587 50	716 00	835 80		15	567 00	690 00	808 00
	20	627 00	764 00	881 00		18	615 00	750 00	875 20		16	597 00	726 40	850 00
110	1	147 50	178 00	209 00		19	643 00	784 00	914 60		17	627 00	762 80	892 00
	2	185 40	224 80	264 00		20	671 00	818 00	954 00		18	657 00	799 20	934 00
	3	212 00	257 60	302 30		1	165 00	199 00	234 80		19	687 00	835 60	976 00
	4	239 00	290 40	340 60	116	2	203 00	246 40	289 20		20	717 00	872 00	1018 00

Prices of Rope Sheaves of larger dimensions than listed, furnished on application.

For additional Prices for Split Sheaves see page 112.



# SPLIT ROPE DRIVE SHEAVES.



Additional List Prices to be added to List Prices of Whole  
Sheaves on pages 106 to 111.

Grooves.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Diameter, in.																				
12 to 18.....	\$ 2 80	\$ 3 70	\$ 4 50	\$ 5 40	\$ 6 20	\$ 7 10	\$ 8 00	\$ 8 90	\$ 9 70	\$ 10 60	\$ 11 50	\$ 12 50								
20 to 26.....	3 50	4 60	5 80	6 90	8 00	9 10	10 30	11 40	12 50	13 60	14 80	15 90	\$ 17 00	\$ 18 10	\$ 19 30	\$ 20 40	\$ 21 50	\$ 22 60	\$ 23 80	\$ 24 90
28 to 34.....	4 30	5 50	6 80	8 30	9 60	11 00	12 40	13 80	15 10	16 50	17 90	19 30	20 70	22 10	23 50	24 90	26 20	27 60	29 00	30 40
36 to 42.....	5 00	6 60	8 30	10 00	11 50	12 90	14 50	16 40	18 10	19 70	21 30	23 00	24 60	26 20	27 80	29 50	31 10	32 80	34 40	36 00
44 to 50.....	5 80	7 60	9 40	11 30	13 20	15 10	17 00	18 90	20 70	22 60	24 50	26 40	28 30	30 20	32 10	34 00	35 80	37 70	39 60	41 50
52 to 58.....	6 50	8 60	10 70	12 80	15 00	17 10	19 30	20 40	23 50	25 70	27 90	30 00	32 10	34 20	36 30	38 50	40 70	42 80	45 00	47 20
60 to 66.....	7 30	9 60	12 00	14 40	16 80	19 20	21 60	24 00	26 40	28 70	31 10	33 50	35 90	38 30	40 70	43 10	45 50	47 90	50 30	52 70
68 to 74.....	8 00	10 60	13 30	15 90	18 60	21 20	23 80	26 40	29 10	31 70	34 30	37 00	39 70	42 30	45 00	47 60	50 30	52 90	55 60	58 30
76 to 82.....	8 80	11 60	14 40	17 40	20 30	23 30	26 20	29 10	32 00	34 90	37 70	40 60	43 50	46 40	49 30	52 20	55 10	58 10	61 00	64 00
84 to 90.....	9 50	12 60	15 70	18 80	22 00	25 20	28 40	31 50	34 70	37 80	41 00	44 20	47 30	50 40	53 60	56 80	60 00	63 20	66 40	69 60
92 to 98.....	10 30	13 70	17 00	20 50	23 90	27 30	30 70	34 10	37 50	40 90	44 30	47 70	51 10	54 50	57 90	61 40	64 80	68 20	71 60	75 00
100 to 106.....	11 00	14 60	18 20	21 80	25 40	29 10	32 70	36 40	40 10	43 80	47 40	51 10	54 80	58 40	62 10	65 70	69 40	73 10	76 80	80 60
108 to 114.....	11 80	15 60	19 40	23 30	27 20	31 10	35 00	38 90	42 90	46 80	50 80	54 70	58 60	62 50	66 50	70 40	74 30	78 20	82 20	86 20
116 to 120.....	12 50	16 60	20 70	25 00	29 20	33 30	37 50	41 70	45 80	50 00	54 20	58 30	62 50	66 60	70 80	75 00	79 20	83 40	87 60	91 80



**HANGING TENSION—WITHOUT GUIDES:**

With 30-inch sheave.....\$44

We furnish for this 1 30-inch 1-groove sheave with yoke, shaft and boxes, and 100 lbs. of weights.

**VERTICAL TENSION—WITH GUIDES.**

Length of Carriage.	4 feet.	8 feet.	12 feet.	16 feet.
	\$45 50	\$49 00	\$53 00	\$57 00

For extra lengths add 56c net, per foot.

We furnish for this 1 30-inch 1-groove sheave, with yoke, shaft and boxes, 2 sheaves and yokes for weight rope; 100 lbs. of weights and gas pipe guides.

**HORIZONTAL TENSION CARRIAGE.**

Length of Carriage.	8 feet.	12 feet.	16 feet.	20 feet.
	\$94 00	\$96 50	\$111 00	\$114 00

For extra lengths add 45c net, per foot.

We furnish for this 2 Angle Iron Tracks for carriage to travel on; 1 30-inch 1-groove sheave with carriage shaft and boxes. Carriage so constructed as to allow the sheave to be placed at any required angle. One sheave and yoke for weight rope, and 100 lbs. of weights.

**SHEAVES AND YOKES—FOR WEIGHT ROPES.**

	8 in. diam.	10 in. diam.	12 in. diam.
	\$3 00	\$3 40	\$4 20

# THE NICHOLSON PATENT FLANGED FACE COMPRESSION SHAFT COUPLING.

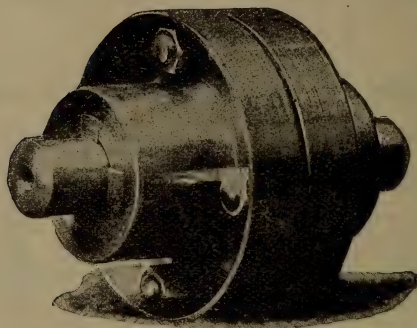


Fig. 2208.

Diameter of Shaft. Inches.	Length of Coupling. Inches.	Price per Pair.
1 $\frac{3}{8}$	5 $\frac{1}{4}$	4.75
1 $\frac{1}{2}$	5 $\frac{3}{4}$	5.00
1 $\frac{3}{4}$	6 $\frac{1}{4}$	5.50
1 $\frac{1}{2}$	6 $\frac{3}{4}$	6.25
1 $\frac{3}{4}$	8	8.00
2 $\frac{1}{8}$	8 $\frac{1}{2}$	9.00
2 $\frac{1}{2}$	9 $\frac{3}{4}$	10.75
2 $\frac{3}{4}$	10 $\frac{1}{4}$	13.00
2 $\frac{1}{2}$	11 $\frac{1}{4}$	16.00
3 $\frac{1}{8}$	12 $\frac{1}{4}$	19.00
3 $\frac{1}{2}$	13 $\frac{1}{4}$	23.00
3 $\frac{3}{4}$	14 $\frac{1}{4}$	30.00
4 $\frac{1}{8}$	16 $\frac{1}{4}$	42.00
4 $\frac{1}{2}$	17 $\frac{3}{4}$	55.00
5 $\frac{1}{8}$	19 $\frac{1}{4}$	65.00
5 $\frac{1}{2}$	21 $\frac{1}{4}$	76.00

All regular sizes carried in stock for immediate shipment. Special sizes or reducing couplings furnished very promptly.

Prices of intermediate sizes same as next larger coupling listed. For reducing couplings, take price of coupling for the larger of the two shafts and add 20 per cent.

## BOX WRENCHES.



Fig. 2209.

## BOX WRENCHES. Sizes and Prices.

No.	Length Wrench. Inches.	Size, Inches, Couplings used on:	Price Each, Net.
1	12	1 $\frac{3}{8}$ to 1 $\frac{1}{2}$ , inclusive...	.15
2	14	1 $\frac{1}{2}$ " 2 $\frac{1}{8}$ "	.20
3	16	2 $\frac{1}{8}$ " 3 $\frac{1}{2}$ "	.25
4	18	3 $\frac{1}{8}$ " 4 $\frac{1}{2}$ "	.30
5	21	4 $\frac{1}{8}$ " 6 "	.35

## THE NICHOLSON PATENT FLANGED FACE COMPRESSION SHAFT COUPLING.

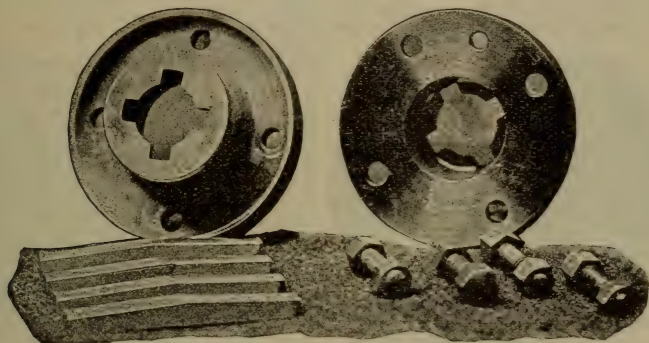


Fig. 2207.

View Showing Construction of the Nicholson Patent Coupling.

In design, construction, and general operation it more completely meets the requirements of a first-class shaft coupling than any other now upon the market.

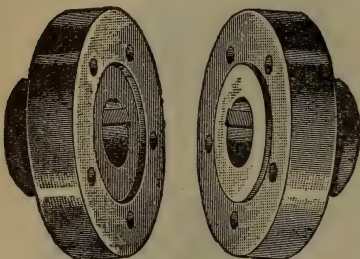
In appearance it resembles the ordinary flanged face coupling. The two half castings are bored tapering, and have flanges on rim to cover bolt heads and nuts. The outer faces of hubs are closed almost to shaft by a rib or projection, through which slots are cut to space the jaws a uniform distance apart and hold them in position while coupling is being fixed on the shaft. The steel jaws have double taper, turned to fit bores of castings, and are concaved on their inner faces a trifle less than the radius of shaft, which makes the grip positive when flanges are drawn up by the bolts. The couplings are fitted so that flanges stand from  $\frac{3}{8}$  to  $\frac{1}{4}$  of an inch apart when drawn tight with the bolts, thus enabling a trifle larger or smaller size of shaft than gauge to be coupled.

This feature will be readily appreciated by users, in that it allows extra couplings to be carried in stock so that in case of an accident they can be immediately applied to shafts which may have become broken or twisted off, or another shaft may be coupled on without the necessity of key-seating old shaft or making exact measurements to insure a perfectly tight fit.

Scotland; F. H. Stromberg, Altena, Germany; Edison Machine Co., Schenectady, N. Y.; American Tool & Machine Co., Boston, Mass.; Davis & Furber Machine Co., North Andover, Mass.; Geo. V. Cressen, Philadelphia, Pa.; Kilburn, Lincoln & Co., Fall River, Mass.; James Hunter & Son, North Adams, Mass.; Union Iron Works, Portland, Oregon; P. Prybil, New York City; Clot & Meese, San Francisco, Cal.; Watson Machine Co., Paterson, N. J.; Benjamin Eastwood, Paterson, N. J.; C. F. McMurray, Troy, N. Y.; E. G. Smyers' Sons, York, Pa.; Fairmount Machine Co., Philadelphia, Pa.; August Wolf & Co., Chambersburg, Pa.; Holyoke Machine Co., Worcester, Mass.; Kitson Machine Co., Lowell, Mass.

A complete stock of 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22 and 24-foot lengths always on hand. A moderate charge will be made for cutting to other lengths. Special prices made on  $5\frac{3}{16}$  in. to 10 in. diameter, also on longer than standard lengths.

Shafting not boxed for shipment without instructions.



CUT NO. 13. FLANGED FACE COUPLING.

## Flanged Faced Couplings.

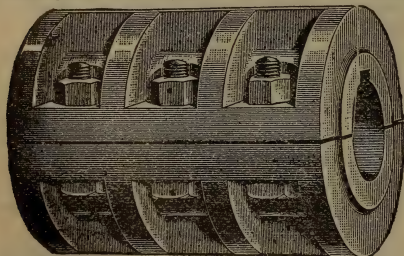
FOR PRICE LIST SEE PAGE 117.

These couplings are very strong. The faces are made male and female, and are accurately fitted together. They are bolted with hexagon head and nut machine bolts. The flanges are of sufficient width to protect the heads and nuts of bolts. The hubs are turned and ends of hubs faced, and the outside and edges of flanges are turned. These couplings are key-seated and provided with keys. When ordered fitted to shaft they are driven in place and keyed, and are again faced off while on the shaft, thus insuring a perfect running line. When specially ordered, we are prepared to furnish these couplings finished as above with *turned bolts and reamed holes*, or *turned all over with turned bolts and reamed holes*. See price list for extra charges.

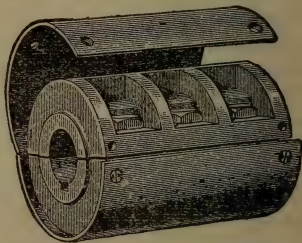
## COMPRESSION COUPLINGS.

FOR PRICE LIST SEE PAGES 117 and 118.

Long and severe tests have proven these couplings to be equal in all respects to any on the market. They clamp the shaft with all the direct force of the bolts and, through our improved process, by which the bearings are made perfectly straight, hold the ends of the shafts parallel with a positive grip. A very desirable feature of this coupling is that it may be



CUT NO. 14. COMPRESSION COUPLING.



CUT NO. 15. COMPRESSION COUPLING WITH SHELL.

removed and replaced without disturbing the shaft. We also make these couplings with a shell or cover (see cut No. 15), which is turned up so as to form a pulley face, on which a belt may be run. When these couplings are ordered with shafting fitted we fit them to the shaft, and after so doing line up and run the shafts between bearings in our works to insure a perfect running line.



# FLANGED FACE COUPLINGS.

SEE CUT NO. 13.

DESCRIPTION ON PAGE 116.

Diam. of Shaft.	13/16	17/16	11/16	115/16	29/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16	57/16	515/16
Cipher.....	Sanguine	Sanscrit	Sansrit	Sansrit	Sap	Sarcasus	Sardonic	Saros	Sash	Satisfy	Satrap	Satin	Sapling	Sapid	Sapper	Sarco	Sarcoide	Sard
Price, not fitted	\$6 50	7 25	8 50	9 50	10 75	12 75	14 75	16 75	18 75	22 25	27 25	31 00	34 00	39 50	46 50	57 50	69 00	87 00
Price, fitted to shaft.....	\$9 00	10 10	11 70	13 50	14 75	17 50	19 50	22 75	24 75	29 00	34 00	39 00	42 00	49 50	56 50	71 50	84 00	105 00
For Turned Bolts and Reamed Holes, add.....	\$ 60	85	95	1 00	1 00	1 50	1 50	1 90	1 90	2 20	2 20	2 60	2 60	3 20	3 20	3 20	3 30	3 30
If Turned all over with Turned Bolts, etc., add	\$4 00	4 40	4 80	5 50	5 80	6 75	7 15	7 90	8 40	9 10	9 45	10 50	11 40	12 80	13 70	14 60	15 30	16 25

Intermediate sizes, proportionate prices. For Reducing Flange Couplings take one-half of Combined list prices of the two sizes required.

# IMPROVED COMPRESSION COUPLINGS.

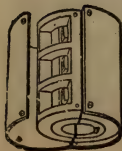
SEE CUT NO. 14.

DESCRIPTION ON PAGE 116.

For Reducing Compression Couplings use the List of Coupling of size of largest end.

Diam. of Shaft	13/16	17/16	111/16	115/16	23/16	27/16	211/16	215/16	33/16	37/16	311/16	315/16	43/16	47/16	411/16	415/16
Cipher.....	Tahard	Tabby	Tabular	Tacit	Tactile	Tactile	Tagbalt	Tailstock	Tailwise	Talented	Tailman	Tamack	Tamack	Tame	Tamely	Tankin
Price, not fitted	\$3 60	4 20	4 90	5 60	7 50	8 75	10 50	12 25	14 00	15 50	17 75	23 25	26 00	31 00	35 50	42 00
Price, fitted.....	\$5 20	5 80	6 50	7 20	9 90	12 00	14 00	16 25	18 75	20 00	23 40	27 25	32 00	39 00	43 50	52 00

Intermediate sizes at proportionate prices. All sizes from 23/16 inches up are provided with a key and steel pins without extra charge; the smaller sizes do not require keys.



## COMPRESSION COUPLINGS—WITH SHELL.

SEE CUT NO. 15.

DESCRIPTION ON PAGE 116.

For Reducing Compression Couplings use the list of Coupling of size of largest end.

Diam. of Shaft.	13/16	17/16	11 1/16	1 5/16	23/16	27/16	2 1/16	2 15/16	35/16	37/16	3 11/16	3 15/16
Cipher.....	Xylite	Xebec	Xylofile	Xenium	Xenotime	Xerodes	Xanthine	Xanthogen	Xenodochy	Xiphias	Xylograph	Xeriff
Price, not fitted	\$5 80	6 40	7 90	8 90	10 80	12 00	14 90	18 85	22 50	26 00	30 75	37 25
Price, fitted....	\$7 40	8 00	9 50	10 75	13 20	15 25	18 40	22 85	27 25	31 00	36 40	43 00

## DENTAL COUPLINGS.

WITH SPIRAL OR SQUARE JAW ACCURATELY BORED, TURNED ON OUTSIDE.

SPIRAL COUPLINGS, SEE CUT NO. 17. SQUARE JAW COUPLING, SEE CUT NO. 16.

DESCRIPTION ON PAGE 119.



Diam. of Shaft.	13/16	17/16	1 11/16	1 5/16	23/16	27/16	2 15/16	33/16	37/16	3 11/16	3 15/16	45/16	47/16	4 11/16	4 15/16	57/16	5 15/16
Cipher without Lever.	Teebett	Tallis	Tallon	Tamm	Tandy	Tapling	Tatum	Taussig	Teasdale	Teller	Tennent	Tenzler	Terrell	Terry	Tesson	Tetis	Thobus
Price, not fitted	\$3 75	9 60	10 70	12 70	14 90	17 75	24 00	28 00	36 00	44 00	53 00	62 00	72 00	80 00	88 00	96 00	115 60
Price, fitted on shaft.	\$14 25	15 85	16 90	19 40	22 00	25 25	33 00	38 50	48 00	56 50	66 50	77 00	89 00	99 00	109 00	119 00	142 00
Price of Lever.	\$5 00	6 00	7 60	8 00	9 00	10 00	12 50	12 50	12 50	12 50	15 25	15 25	15 25	15 25	18 00	18 00	18 00
Cipher, Coupling with Lever.	Thiel	Thompson	Thorn	Thorppe	Thurston	Tibbs	Tickner	Timber	Tobin	Tomba	Torrence	Tramper	Trank	Traveler	Trippett	Tudor	Tyler

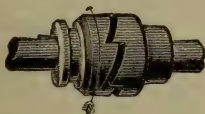
## DENTAL CLUTCH COUPLINGS.

FOR PRICE LIST SEE PAGE 118.

These couplings are valuable where it is desirable to disconnect one part of a line shaft and permit the balance to run, and also for use in coupling up line shafts, where, from the nature of the surroundings, the shaft is likely to get out of line (as in elevator work, where the load in the house is continually shifting).



CUT NO. 16. SQUARE JAW.



CUT NO. 17. SPIRAL JAW,  
LEFT HAND.



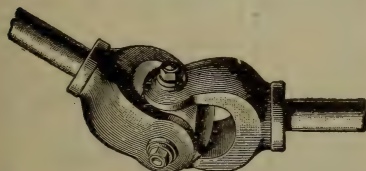
CUT NO. 17. SPIRAL JAW,  
RIGHT HAND.

This clutch can be engaged or disengaged while the shaft revolves at a moderate speed. We also furnish these clutches attached to hubs of pulleys, through which attachment the Pulley can be stopped or started without throwing off the belt. This makes a cheap clutch pulley that can be thrown in or out at a moderate speed.

We can furnish either spiral or square jaw clutches at same price.

In ordering spiral clutches, always state whether they are wanted "right" or "left hand." (see cuts.)

## UNIVERSAL COUPLINGS.



CUT NO. 50.  
UNIVERSAL COUPLINGS.

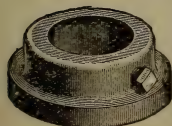
These couplings are of suitable strength to transmit full power of shafts for which they are designed, and will operate at an angle of 25 degrees.

We will be pleased to quote prices on application.

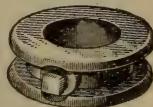
## SET COLLARS.

FOR PRICES SEE PAGE 121.

We make two styles of collars—the plain collar, as shown in cut No. 18, and the safety collars, in which the set screws are protected by flanges, as shown in cut No. 19.

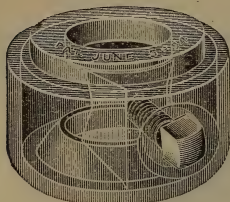


CUT NO. 18. PLAIN  
COLLAR.

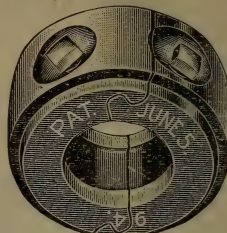


CUT NO. 19. SAFETY  
COLLAR.

## PATENT SAFETY COLLARS.



Solid.



Split.

SIZE.	PRICE EACH.	SIZE.	PRICE EACH.	SIZE.	PRICE EACH.	SIZE.	PRICE EACH.
1 <sup>5</sup> / <sub>8</sub>	62	3 <sup>1</sup> / <sub>8</sub>	\$2 63	5 <sup>3</sup> / <sub>8</sub>	\$6 55	7 <sup>1</sup> / <sub>8</sub>	\$12 22
1	65	3 <sup>3</sup> / <sub>8</sub>	2 70	5 <sup>1</sup> / <sub>4</sub>	6 71	7 <sup>1</sup> / <sub>8</sub>	12 48
1 <sup>1</sup> / <sub>8</sub>	75	3 <sup>1</sup> / <sub>4</sub>	2 77	5 <sup>1</sup> / <sub>2</sub>	6 87	7 <sup>3</sup> / <sub>8</sub>	12 75
1 <sup>3</sup> / <sub>8</sub>	80	3 <sup>3</sup> / <sub>4</sub>	2 92	5 <sup>3</sup> / <sub>4</sub>	7 03	7 <sup>1</sup> / <sub>2</sub>	13 00
1 <sup>1</sup> / <sub>2</sub>	85	3 <sup>7</sup> / <sub>8</sub>	3 00	5 <sup>7</sup> / <sub>8</sub>	7 20	7 <sup>5</sup> / <sub>8</sub>	13 28
1 <sup>5</sup> / <sub>8</sub>	90	3 <sup>9</sup> / <sub>8</sub>	3 08	5 <sup>1</sup> / <sub>2</sub>	7 37	7 <sup>3</sup> / <sub>4</sub>	13 53
1 <sup>3</sup> / <sub>4</sub>	95	3 <sup>1</sup> / <sub>2</sub>	3 14	5 <sup>5</sup> / <sub>8</sub>	7 55	7 <sup>7</sup> / <sub>8</sub>	13 80
1 <sup>7</sup> / <sub>8</sub>	\$1 00	3 <sup>3</sup> / <sub>4</sub>	3 22	5 <sup>5</sup> / <sub>8</sub>	7 72	7 <sup>1</sup> / <sub>2</sub>	14 06
1 <sup>9</sup> / <sub>8</sub>	1 05	3 <sup>1</sup> / <sub>2</sub>	3 30	5 <sup>1</sup> / <sub>2</sub>	7 90	7 <sup>9</sup> / <sub>8</sub>	14 32
1 <sup>5</sup> / <sub>4</sub>	1 10	3 <sup>3</sup> / <sub>4</sub>	3 37	5 <sup>1</sup> / <sub>4</sub>	8 08	7 <sup>1</sup> / <sub>4</sub>	14 58
1 <sup>5</sup> / <sub>8</sub>	1 15	3 <sup>1</sup> / <sub>4</sub>	3 45	5 <sup>1</sup> / <sub>2</sub>	8 25	7 <sup>1</sup> / <sub>8</sub>	14 85
1 <sup>1</sup> / <sub>4</sub>	1 20	3 <sup>7</sup> / <sub>8</sub>	3 52	5 <sup>7</sup> / <sub>8</sub>	8 42	7 <sup>3</sup> / <sub>4</sub>	15 10
1 <sup>3</sup> / <sub>4</sub>	1 25	3 <sup>5</sup> / <sub>8</sub>	3 60	5 <sup>5</sup> / <sub>8</sub>	8 60	7 <sup>1</sup> / <sub>2</sub>	15 30
1 <sup>3</sup> / <sub>8</sub>	1 30	4	3 75	6	8 78	7 <sup>5</sup> / <sub>8</sub>	15 63
1 <sup>7</sup> / <sub>8</sub>	1 35	4 <sup>1</sup> / <sub>8</sub>	4 00	6 <sup>1</sup> / <sub>8</sub>	8 97	7 <sup>5</sup> / <sub>8</sub>	15 90
1 <sup>1</sup> / <sub>2</sub>	1 40	4 <sup>3</sup> / <sub>8</sub>	4 15	6 <sup>1</sup> / <sub>4</sub>	9 16	8	16 18
2	1 45	4 <sup>1</sup> / <sub>2</sub>	4 28	6 <sup>3</sup> / <sub>8</sub>	9 35	8 <sup>1</sup> / <sub>8</sub>	16 46
2 <sup>1</sup> / <sub>8</sub>	1 55	4 <sup>5</sup> / <sub>8</sub>	4 42	6 <sup>1</sup> / <sub>2</sub>	9 53	8 <sup>1</sup> / <sub>4</sub>	16 74
2 <sup>3</sup> / <sub>8</sub>	1 60	4 <sup>3</sup> / <sub>4</sub>	4 56	6 <sup>5</sup> / <sub>8</sub>	9 72	8 <sup>3</sup> / <sub>8</sub>	17 02
2 <sup>1</sup> / <sub>4</sub>	1 65	4 <sup>7</sup> / <sub>8</sub>	4 70	6 <sup>5</sup> / <sub>4</sub>	9 91	8 <sup>1</sup> / <sub>2</sub>	17 30
2 <sup>3</sup> / <sub>4</sub>	1 75	4 <sup>1</sup> / <sub>2</sub>	4 85	6 <sup>7</sup> / <sub>8</sub>	10 10	8 <sup>5</sup> / <sub>8</sub>	17 58
2 <sup>7</sup> / <sub>8</sub>	1 80	4 <sup>5</sup> / <sub>8</sub>	5 15	6 <sup>1</sup> / <sub>2</sub>	10 30	8 <sup>3</sup> / <sub>4</sub>	17 86
2 <sup>9</sup> / <sub>8</sub>	1 88	4 <sup>1</sup> / <sub>2</sub>	5 30	6 <sup>3</sup> / <sub>4</sub>	10 50	8 <sup>7</sup> / <sub>8</sub>	18 15
2 <sup>5</sup> / <sub>4</sub>	2 03	4 <sup>3</sup> / <sub>4</sub>	5 45	6 <sup>5</sup> / <sub>8</sub>	10 70	8 <sup>1</sup> / <sub>2</sub>	18 43
2 <sup>1</sup> / <sub>2</sub>	2 10	4 <sup>1</sup> / <sub>2</sub>	5 60	6 <sup>1</sup> / <sub>2</sub>	10 90	8 <sup>3</sup> / <sub>4</sub>	19 56
2 <sup>3</sup> / <sub>4</sub>	2 17	4 <sup>7</sup> / <sub>8</sub>	5 75	6 <sup>3</sup> / <sub>4</sub>	11 10	9	20 70
2 <sup>1</sup> / <sub>2</sub>	2 25	4 <sup>1</sup> / <sub>2</sub>	5 90	6 <sup>1</sup> / <sub>2</sub>	11 30	9 <sup>1</sup> / <sub>4</sub>	21 90
2 <sup>5</sup> / <sub>8</sub>	2 32	5	6 06	6 <sup>7</sup> / <sub>8</sub>	11 50	9 <sup>1</sup> / <sub>2</sub>	23 12
2 <sup>1</sup> / <sub>4</sub>	2 40	5 <sup>1</sup> / <sub>8</sub>	6 22	6 <sup>5</sup> / <sub>4</sub>	11 70	9 <sup>3</sup> / <sub>4</sub>	24 42
3	2 48	5 <sup>1</sup> / <sub>4</sub>	6 38	7	11 96	10	25 75

For prices of Split Collars add 50 per cent. to list price.

Accurately

Bored,

Turned,

Faced and

Polished.

Positively

The Most

Reliable,

Best and Safest

Collars

On the Market





## KEYS FOR PULLEYS.

Width of Face, Inches.....	.....	3 to 5	6 to 8	9 to 12	13 to 16	17 to 20	21 to 24	25 to 30	31 to 36
Width of Key, ½-inch.	Diam. of Shaft, 1 to 1½-in.	20	27	.....	.....	.....	.....	.....	.....
¾ "	17/16 to 13/16 "	65	80	.....	.....	.....	.....	.....	.....
		23	27	30	.....	.....	.....	.....	.....
		1 15	1 35	1 55	.....	.....	.....	.....	.....
¾ "	1½ to 25/16 "	30	33	36	48	60	.....	.....	.....
		1 50	1 65	1 85	2 20	2 60	.....	.....	.....
¾ "	2½ to 2½ "	30	36	48	60	80	.....	.....	.....
		1 60	1 85	2 15	2 50	3 00	.....	.....	.....
¾ "	218/16 to 8¾ "	36	48	54	72	.....	1 70	1 80	1 90
		1 70	2 05	2 35	2 80	3 35	4 60	5 10	5 70
¾ "	35/16 to 31/16 "	48	54	66	85	1 20	1 80	2 00	2 10
		2 00	2 25	2 75	3 35	4 15	5 10	5 75	6 30
1 "	313/16 to 4¼ "	60	66	85	1 00	1 45	2 00	2 15	2 35
		2 30	2 75	3 35	4 00	4 75	5 75	6 30	7 00
1½ "	45/16 to 411/16 "	72	85	1 00	1 20	1 70	2 40	2 50	2 65
		2 80	3 35	4 00	4 50	5 50	6 60	7 15	7 65
1½ "	4¼ to 5¼ "	90	1 00	1 20	1 55	2 00	2 90	3 10	3 30
		3 40	4 00	4 50	5 35	6 25	7 50	8 10	8 70

See lists for key-seating shafts and pulleys.

Prices of fitted keys do not include key-seating pulleys nor shafts.

Feather keys are furnished for double-arm pulleys.

## SHAFTING.

**STEEL OR IRON. TURNED, COLD-ROLLED AND POLISHED.**

	13/16	17/16	11 1/16	155/16	23/16	27/16	211/16	215/16	33 1/16	37/16	311/16	315/16	43/16	47/16	41 1/16	415/16
Diameter.....																
Cipher for Diam's																
Price Per Foot	\$0 29	39	51	64	79	97	1 16	1 38	1 73	2 03	2 33	2 67	3 11	3 51	4 25	4 71
Boxing, p. ft., let	2 1/2	3	3	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7				
Cipher for lengths																
Feet .....	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

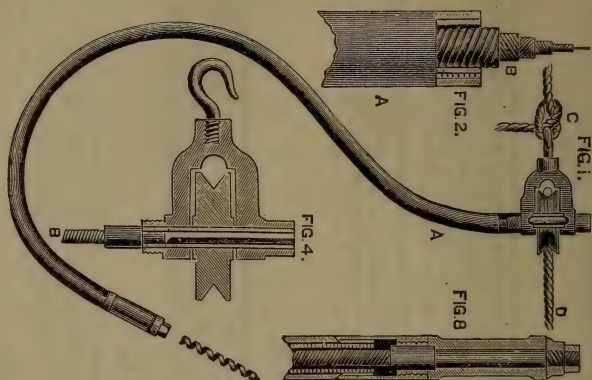
A complete stock of above sizes in 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22 and 24-foot lengths always on hand. A moderate charge for cutting to other lengths. Special prices made on 3 1/16 to 10 inches diameter. Also on longer than standard length shaft. Shafting not boxed for shipment without instructions.

## JOURNALS ON SHAFTS.

Diameter of Shaft,.....	13/16	17/16	111/16	115/16	283/16	271/16	211/16	215/16	337/16	311/16	315/16	439/16	471/16	411/16	415/16
Journals 6 inches long or less, each.....	\$1 20	1 25	1 30	1 45	1 55	1 75	1 90	2 10	2 30	2 45	2 65	3 00	3 35	3 80	4 20
Each additional 3 inches or less.....	0 27	0 30	0 30	0 30	0 35	0 38	0 41	0 41	0 45	0 45	0 45	0 66	0 66	0 78	0 90

## KEY-SEATING SHAFTS:

	13/16	17/16	11 1/16	115/16	23/16	27/16	211/16	335/16	37/16	311/16	435/16	47/16	411/16	415/16	535/16	57/16	511/16	515/16
Diameter of Shaft...																		
Key-Seat for Coupling- key each end...	\$0 42	42	48	48	48	54	54	60	65	65	85	1 10	1 10	1 30	1 45	1 70	1 90	2 10
Key-Seats for Pulleys One Foot long or Less...	\$0 54	54	60	60	65	65	80	80	1 00	1 00	1 10	1 30	1 30	2 00	2 40	2 65	2 90	3 30
For each additional ft. or fraction of ft.	\$0 18	19	22	27	27	36	36	54	54	60	70	90	90	1 30	1 50	1 85	2 00	2 15



The above cut is a sectional view of the Stow Flexible Shaft. Fig. 1, Complete Shaft; Fig. 2, Construction of Core; Fig. 3, Hand Piece; Fig. 4, Head Piece; A A, Leather and Wire Case; B, Core; C, Cord for Tightening Belt; D, is Driving Belt. *Core B must be kept well lubricated with lard oil, tallow or other animal oil. Never use mineral oil.*

Throughout this Catalogue, and in all correspondence, the term Flexible Shaft means the Shaft only, as shown in this cut.



## PRICE LIST OF FLEXIBLE SHAFTS

### AS PER ABOVE CUT

Selling Nos.	0	1	2	3	4	5	6	8	9	11
Diameter of Core in inches..	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1	1 $\frac{1}{2}$	1 $\frac{3}{4}$
Length of Shaft in feet .....	3	3 $\frac{1}{2}$	4	5	6	7	8	8	8	10
Wt. complete as per cut.....	3	5	7	10	18	30	35	60	80	128
Price complete as per cut.....	\$16.00	\$18.00	\$25.00	\$30.00	\$40.00	\$50.00	\$60.00	\$80.00	\$100.00	\$160.00
Price per foot extra .....	1.80	2.40	2.70	3.00	3.75	4.50	5.25	8.25	12.00	16.00

Cores can be wound to run left as well as right handed if desired, but neither will transmit their maximum power when run backward.



## STANDARD STEAM, GAS, AND WATER PIPE.

BLACK AND GALVANIZED.



Revised List adopted February 15, 1900. Subject to change without notice.

Nominal inside diameter	Price per foot	Thickness	Nominal weight per foot	Number of threads per inch of screw
$\frac{1}{8}$	\$0 05 $\frac{1}{2}$	.068	0.24	27
$\frac{1}{4}$	05 $\frac{1}{2}$	.088	0.42	18
$\frac{3}{8}$	05 $\frac{1}{2}$	.091	0.56	18
$\frac{1}{2}$	08 $\frac{1}{2}$	.109	0.54	14
$\frac{3}{4}$	11 $\frac{1}{2}$	.113	1.12	14
1	16 $\frac{1}{2}$	.134	1.07	11 $\frac{1}{2}$
1 $\frac{1}{4}$	22 $\frac{1}{2}$	.140	2.24	11 $\frac{1}{2}$
1 $\frac{1}{2}$	27	.145	2.68	11 $\frac{1}{2}$
2	36	.154	3.61	11 $\frac{1}{2}$
2 $\frac{1}{2}$	57 $\frac{1}{2}$	.204	5.74	8
3	75 $\frac{1}{2}$	.217	7.54	8

Nominal inside diameter	Price per foot	Thickness	Nominal weight per foot	Number of threads per inch of screw
3 $\frac{1}{2}$	\$0 95	.226	9.00	8
4	1 08	.237	10.66	8
4 $\frac{1}{2}$	1 30	.246	12.49	8
5	1 45	.250	14.50	8
6	1 88	.280	18.76	8
7	2 35	.301	23.27	8
8	2 82	.322	28.18	8
9	3 40	.344	33.70	8
10	4 25	.368	40.00	8
11	4 75	.375	45.00	8
12	5 20	.375	49.00	8

Extra Strong  
Steam, Gas and Water Pipe.

Size, inches	Actual outside diameter	Nominal inside diameter	Thickness	Nominal weight per foot	Price per foot
$\frac{1}{8}$	.405	.205	.100	.29	\$0 11
$\frac{1}{4}$	.540	.294	.123	.54	11
$\frac{3}{8}$	.675	.421	.127	.74	11
$\frac{1}{2}$	.840	.542	.149	1.09	12
$\frac{3}{4}$	1.05	.736	.157	1.39	15
1	1.315	.951	.182	2.17	22
1 $\frac{1}{4}$	1.66	1.272	.194	3.00	30
1 $\frac{1}{2}$	1.90	1.494	.203	3.63	36
2	2.375	1.833	.221	5.02	50
2 $\frac{1}{2}$	2.875	2.315	.280	7.67	81
3	3.500	2.892	.304	10.25	1 05
3 $\frac{1}{2}$	4.000	3.385	.321	12.47	1 33
4	4.500	3.818	.341	14.97	1 50
4 $\frac{1}{2}$	5.000	4.280	.360	18.22	1 95
5	5.563	4.813	.375	20.54	2 18
6	6.625	5.750	.437	28.58	2 90
7	7.625	6.625	.500	37.67	3 80
8	8.625	7.625	.500	43.00	4 30

Extra Strong and Double Extra Strong will be shipped in random lengths and plain ends unless otherwise ordered.

Double Extra Strong  
Steam, Gas and Water Pipe.

Size, inches	Actual outside diameter	Nominal inside diameter	Thickness	Nominal weight per foot	Price per foot
$\frac{1}{8}$	.84	.244	.298	1.70	\$0 25
$\frac{1}{4}$	1.05	.422	.314	2.44	30
$\frac{3}{8}$	1.315	.587	.364	3.65	37
1	1.66	.885	.388	5.20	52
1 $\frac{1}{4}$	1.90	1.088	.406	6.40	65
1 $\frac{1}{2}$	2.375	1.491	.442	9.02	95
2	2.875	1.755	.560	13.68	1 37
2 $\frac{1}{2}$	3.50	2.284	.608	18.56	1 92
3	4.00	2.716	.642	22.75	2 45
3 $\frac{1}{2}$	4.50	3.136	.682	27.48	2 85
4	5.00	3.564	.718	32.53	3 30
4 $\frac{1}{2}$	5.563	4.083	.75	38.12	3 80
5	6.625	4.875	.875	53.11	5 30
6	7.625	5.875	.875	62.38	6 25
7	8.625	6.875	.875	71.62	7 20

Double Extra Strong will be shipped in random lengths and plain ends unless otherwise ordered.

## Cutting Standard Threads on Wrought Iron Pipe.

Size, inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	12	14	16
Price, each	5c	6c	5c	6c	5c	6c	7c	8c	10c	15c	20c	25c	35c	45c	55c	70c	85c	\$1 00	1 25	1 50	2 50	3 50	5 00

## Cutting Lock-nut Threads on Wrought Iron Pipe.

Size, inches.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, each.....	10c	10c	10c	10c	12c	14c	16c	20c	30c	40c	50c	70c

TABLE OF DIMENSIONS OF  
EXTRA STRONG WROUGHT IRON PIPE.

Nominal Inside Diameter.	Actual Inside Diameter.	Actual Outside Diameter.	Thickness.	Inside Circumference.	Outside Circumference.	Length of Pipe per Square Foot of Inside Surface.	Length of Pipe per Square Foot of Outside Surface.	Inside Area.	Outside Area.	Nominal Weight per Foot.
Inches.	Inches.	Inches.	Inch.	Inches.	Inches.	Feet.	Feet.	Sq. Inches.	Sq. Inches.	Pounds.
$\frac{1}{8}$	.20	.40	.10	.64	1.27	18.63	9.43	.08	.12	.29
$\frac{1}{4}$	.29	.54	.12	.92	1.69	12.98	7.07	.06	.22	.54
$\frac{3}{8}$	.42	.67	.12	1.32	2.12	9.07	5.65	.13	.35	.74
$\frac{1}{2}$	.54	.84	.14	1.70	2.63	7.04	4.54	.23	.55	1.09
$\frac{3}{4}$	.73	1.05	.15	2.31	3.29	5.10	3.63	.45	.86	1.39
1	.95	1.31	.18	2.98	4.13	4.01	2.90	.71	1.35	2.17
$1\frac{1}{4}$	1.27	1.66	.19	3.99	5.21	3.00	2.30	1.27	2.16	3.00
$1\frac{1}{2}$	1.49	1.90	.20	4.69	5.96	2.55	2.01	1.75	2.83	3.63
2	1.93	2.37	.22	6.07	7.46	1.97	1.60	2.93	4.43	5.02
$2\frac{1}{2}$	2.31	2.87	.28	7.27	9.03	1.64	1.32	4.20	6.49	7.67
3	2.89	3.50	.30	9.08	10.99	1.32	1.00	6.56	9.62	10.25
$3\frac{1}{2}$	3.35	4.00	.32	10.54	12.56	1.13	.95	8.85	12.56	12.47
4	3.81	4.50	.34	11.99	14.13	1.00	.84	11.44	15.90	14.97
$4\frac{1}{2}$	4.25	5.00	.35	13.35	15.71	.90	.76	14.18	19.63	17.60
5	4.81	5.56	.37	15.12	17.47	.79	.68	18.10	24.30	20.54
6	5.75	6.62	.43	18.06	20.81	.66	.57	25.93	34.47	28.58
7	6.62	7.63	.50	20.81	23.95	.58	.50	34.47	45.66	37.60
8	7.50	8.62	.56	23.56	27.10	.51	.44	44.18	58.42	47.85

Extra Strong and Double Extra Strong Pipe is always shipped without threads or couplings, unless otherwise specified.

Threads and Couplings on extra strong pipe are always charged extra. Quotations will not cover them unless they are clearly specified in requests for prices.

For prices see latest current lists.

TABLE OF DIMENSIONS OF  
DOUBLE EXTRA STRONG WROUGHT IRON PIPE.

Nominal Inside Diameter.	Actual Inside Diameter.	Actual Outside Diameter.	Thickness.	Inside Circumference.	Outside Circumference.	Length of Pipe per Square Foot of Inside Surface.	Length of Pipe per Square Foot of Outside Surface.	Inside Area.	Outside Area.	Nominal Weight per Foot.
$\frac{3}{8}$	.23	.67	.22	.73	2.12	15.69	5.65	.04	.36	.96
$\frac{1}{2}$	.24	.84	.29	.76	2.63	15.66	4.54	.04	.55	1.50
$\frac{3}{4}$	.42	1.05	.31	1.32	3.29	9.04	3.63	.13	.86	2.30
1	.58	1.31	.36	1.84	4.13	6.50	2.90	.27	1.35	3.40
$1\frac{1}{4}$	.88	1.66	.38	2.78	5.21	4.31	2.30	.61	2.16	5.00
$1\frac{1}{2}$	1.09	1.90	.40	3.41	5.96	3.51	2.01	.93	2.83	6.45
2	1.49	2.37	.44	4.68	7.46	2.56	1.60	1.74	4.43	9.00
$2\frac{1}{2}$	1.75	2.87	.56	5.51	9.03	2.17	1.32	2.41	6.49	13.30
3	2.28	3.50	.60	7.17	10.99	1.67	1.09	4.09	9.62	18.50
$3\frac{1}{2}$	2.71	4.00	.64	8.53	12.56	1.40	.95	5.79	12.56	22.00
4	3.13	4.50	.68	9.85	14.13	1.21	.84	7.72	15.90	27.48
$4\frac{1}{2}$	3.56	5.00	.72	11.20	15.71	1.05	.76	9.96	19.64	32.45
5	4.06	5.56	.75	12.76	17.47	.94	.68	12.69	24.30	38.12
6	4.87	6.62	.78	15.89	20.81	.78	.57	20.10	34.47	53.11
7	5.98	7.62	.82	18.83	23.95	.62	.50	28.16	45.66	60.34
8	6.88	8.62	.87	21.61	27.10	.56	.44	37.17	58.43	71.52

Extra Strong and Double Extra Strong Pipe is always shipped without threads or couplings, unless otherwise specified.

Threads and Couplings on extra strong and double extra strong pipe are always charged extra. Quotations will not cover them, unless they are clearly specified in requests for prices.

For prices see latest current lists.

# STANDARD LAP-WELDED BOILER TUBES.



List revised and adopted February 15, 1900. Subject to change without notice.

Outside Diameter inches	Price per foot	Thickness inches	Thickness nearest B. W. G.	Nominal weight per foot	Outside Diameter inches	Price per foot	Thickness inches	Thickness nearest B. W. G.	Nominal weight per foot
1	\$ 30	.095	13	.90	4½	\$ 62	.134	10	6.17
1½	28	.095	13	1.15	5	75	.148	9	7.58
1¾	27	.095	13	1.40	6	1 00	.165	8	10.16
2	22	.095	13	1.66	7	1 20	.165	8	11.90
2½	20	.095	13	1.91	8	1 50	.165	8	13.85
2¾	24	.095	13	2.16	9	1 70	.180	7	16.76
3	28	.109	12	2.75	10	2 10	.203	6	21.00
3½	34	.109	12	3.04	11	2 50	.220	5	25.00
3¾	35	.109	12	3.33	12	2 90	.229	4½	28.50
4	40	.120	11	3.96	13	3 20	.238	4	32.66
4½	44	.120	11	4 28	14	3 65	.248	3½	36.00
4¾	50	.120	11	4.60	15	4 10	.259	3	40.60
5	55	.134	10	5.47	16	4 60	.270	2½	45.20

## EXTRA WIRE GAUGE BOILER TUBES.

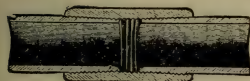
For Extra Wire Gauge Boiler Tubes, away from standard not exceeding four wire gauges, one cent for each inch in diameter of tube for each additional gauge will be charged and added to net of invoice.

Tubes more than four wire gauges heavier than standard will be charged by the pound the same as plain end stay tubes, arch pipes, dry pipes, and water grates.

## SOLID DRAWN CHARCOAL HAMMERED IRON BOILER TUBES.

Price on application

## LAP-WELDED CASING FITTED WITH PERFECT V THREADS AND PATENT PROTECTING SLEEVE SOCKETS.



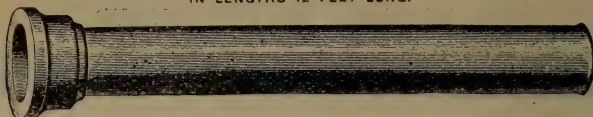
## SCREW AND SOCKET JOINT.

## INSERTED JOINT.

Nominal inside diameter inches	Actual outside diameter inches	Price per foot	Nominal weight per foot pounds	No. threads per inch of screw	Nominal inside diameter inches	Actual outside diameter inches	Price per foot	Nominal weight per foot pounds	No. threads per inch of screw
2	2½	\$ 23	2.22	14	5½	6	\$ 1 05	10.46	14
2½	2¾	29	2.82	14	5¾	6	1 20	12.04	11½
2¾	3	32	3.13	14	5½	6	1 40	14.20	11½
3	3½	35	3.45	14	5½	6	1 60	16.70	11½
3½	3¾	41	4.10	14	6½	6½	1 18	11.58	14
3¾	4	45	4.45	14	6½	6½	1 35	13.32	14 and 11½
4	4½	48	4.78	14	6½	6½	1 70	17.02	11½
4½	4¾	56	5.56	14	6½	7	1 24	12.34	14
4¾	5	60	6.00	14	6½	7	1 75	17.51	11½ and 10
5	5½	64	6.36	14	7½	7½	1 38	13.55	14
5½	6	1 00	9.38	14	7½	8	1 55	15.41	11½
6	6½	68	6.73	14	7½	8	2 10	20.17	11½
6½	7	1 00	9.39	14	8½	8½	1 61	16.07	11½
7	7½	78	7.80	14	8½	8½	2 00	20.10	11½
7½	8	82	8.20	14	8½	8½	2 40	24.38	11½ and 8
8	8½	1 00	9.86	14	8½	9	1 76	17.60	11½
8½	9	1 30	12.80	11½	9½	10	2 20	21.90	11½
9	9½	1 50	15.88	11½	10½	11	2 68	26.72	11½
9½	10	87	8.62	14	11½	12	3 05	30.00	11½
10	10½	1 30	12.49	11½	12½	13	3 38	33.78	11½

## CAST IRON WATER AND GAS PIPE.

IN LENGTHS 12 FEET LONG.



## WATER PIPE.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Thickness, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$
Weight per foot, pounds	17	22	33	42	60	75	117	125	167	197	250	350	475

## GAS PIPE

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Thickness, inches	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{7}{8}$
Weight per foot, pounds	$12\frac{1}{2}$	18	30	40	55	70	85	104	134	150	190	277	350

APPROXIMATE QUANTITIES OF LEAD AND HEMP  
REQUIRED PER JOINT.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30	36
Lead, pounds	4	$5\frac{1}{2}$	8	11	15	18	22	24	26	28	32	38	50
Hemp, ounces	6	7	9	11	13	18	20	22	24	28	32	38	44

## SPECIALS FOR CAST IRON PIPE.

## QUARTER BENDS OR ELBOWS.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30
Weight each, pounds	48	60	112	200	266	376	450	650	750	1000	1500	2300

## EIGHTH BENDS.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30
Weight each, pounds	42	60	125	200	276	390	430	510	820	1200	1450	2200

## SLEEVES.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30
Weight each, pounds	30	42	76	110	146	208	300	360	360	557	710	965

## PLUGS.

Size, inches	3	4	6	8	10	12	14	16	18	20	24	30
Weight each, pounds	10	12	22	32	46	66	70	100	125	150	135	370

## CAPS.

Size, inches	3	4	6	8	10	12
Weight each, pounds	15	25	60	75	100	120

## TEES.

Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds	Size, Inches	Weight, Pounds
3 x 3 x 3	80	8 x 8 x 4	250	12 x 12 x 40	525	24 x 24 x 24	2000
4 x 4 x 4	100	10 x 10 x 10	390	12 x 12 x 8	510	30 x 30 x 30	2880
6 x 6 x 6	204	10 x 10 x 8	354	12 x 12 x 6	500	36 x 36 x 36	4920
6 x 6 x 4	154	10 x 10 x 6	312	12 x 12 x 4	480	48 x 48 x 48	9600
8 x 8 x 8	294	10 x 10 x 4	300	16 x 16 x 16	900		
8 x 8 x 6	266	12 x 12 x 12	540	20 x 20 x 20	1390		

The above weights on Cast Iron Pipe and Specials are approximate only and are given simply for convenience in estimating.

Unless otherwise ordered all Cast Iron Water Pipe will be furnished coated inside and out, and Gas Pipe will be furnished not coated.





## WROUGHT IRON NIPPLES.

PLAIN RIGHT HAND.



CLOSE.

Price List adopted February 15, 1900.

SHOULDER

LENGTH IN INCHES.						Size.  Inches.	PRICES.		PRICES OF EXTRA LONG NIPPLES.										
Close	Short.	Long.					Close or Short.	Long.	Lengths in Inches.										
								4	5	6	7	8	9	10	11	12			
$\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{4}$	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19		
$\frac{1}{2}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{2}$	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19		
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{3}{4}$	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19		
$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	1	.05	.07	.08	.10	.12	.14	.16	.18	.20	.22	.23		
$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$1\frac{1}{8}$	.06	.09	...	.11	.13	.17	.18	.20	.22	.24	.26		
$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$1\frac{1}{4}$	.08	.13	...	.15	.18	.23	.25	.28	.31	.34	.36		
$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$1\frac{1}{2}$	.11	.17	...	.20	.24	.29	.33	.36	.40	.44	.47		
2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	2	.13	.20	...	.25	.29	.36	.40	.45	.50	.54	.59		
$2\frac{1}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$2\frac{1}{8}$	.18	.27	...	.32	.38	.50	.54	.59	.65	.72	.77		
$2\frac{1}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$2\frac{1}{4}$	.39	.59	...	...	.68	.90	.97	1.06	1.17	1.26	1.35		
$2\frac{3}{8}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$2\frac{3}{8}$	.48	.73	...	...	.85	1.08	1.20	1.33	1.45	1.58	1.70		
$2\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$2\frac{1}{2}$	.75	1.05	...	...	...	1.80	1.45	1.60	1.75	1.90	2.05		
3	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	3	.85	1.20	...	...	...	1.52	1.69	1.87	2.05	2.22	2.40		
$3\frac{1}{8}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$3\frac{1}{8}$	1.25	1.70	...	...	...	2.25	2.60	2.75	2.95	3.17	3.40		
$3\frac{1}{2}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	4	1.55	2.45	...	...	...	2.58	2.83	3.10	3.35	3.60	3.85		
$3\frac{3}{8}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	5	1.85	2.90	...	...	...	3.05	3.25	3.70	4.00	4.30	4.65		
4	5	6	...	...	...	6	3.20	3.60	...	...	...	4.05	4.45	4.90	5.30	5.75	6.15		
5	6	8	...	...	...	8	3.55	4.05	...	...	...	4.55	5.05	5.50	6.00	6.50	7.00		
5	6	8	...	...	...	9	6.25	6.50	...	...	...	...	...	7.10	7.75	8.40	9.00		
5	6	8	...	...	...	10	6.75	8.25	...	...	...	...	...	8.90	9.70	10.40	11.15		
5	6	8	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...		
5	6	8	...	...	...	12	8.00	10.00	...	...	...	...	...	10.80	11.75	12.70	13.65		

Nipples made to order from extra heavy pipe at double above list.



## LONG SCREWS

WITH COUPLING AND LOCK NUT FACED.

Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Standard Length..	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9
Black.....Each	.30	.35	.40	.55	.75	1.00	1.30	1.70	2.70	3.70	5.40	6.60
Galvanized.....	.35	.40	.50	.66	1.00	1.25	1.60	2.10	3.10	4.70	....	....

Long Screws, longer than Standard, made to order and charged as Cut Pipe.  
Threads, Couplings, and Lock Nuts extra.

## LOCKNUT NIPPLES.

NOT OVER 6 INCHES LONG.



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Black.....Each	.18	.20	.22	.25	.30	.40	.50	.80	1.25	1.50
Galvanized.....	.23	.25	.30	.35	.45	.55	.70	1.00	1.50	1.90

## WROUGHT NIPPLES

PLAIN RIGHT AND LEFT.

Price List adopted February 15, 1900.

LENGTH IN INCHES.						Size.  Inches.	PRICES.		PRICES OF EXTRA LONG R. AND L. NIPPLES.										
Close.	Short.	Long.					Close or Short.	Long.	Lengths in Inches.										
									4	5	6	7	8	9	10	11	12		
$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{8}$	.05	.08	.09	.11	.13	.16	.18	.20	.22	.25	.27		
$\frac{7}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{3}{16}$	.05	.08	.09	.11	.13	.16	.18	.20	.22	.25	.27		
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{2}$	.05	.08	.09	.11	.13	.16	.18	.20	.22	.25	.27		
$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{5}{16}$	.07	.10	.11	.13	.16	.18	.21	.24	.27	.29	.31		
$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$\frac{3}{4}$	.08	.12	.13	.17	.23	.25	.27	.29	.32	.35			
$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	1	.11	.18	.20	.24	.31	.33	.37	.41	.45	.48			
$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$1\frac{1}{4}$	.15	.23	.27	.32	.39	.45	.50	.55	.60	.65			
2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$1\frac{1}{2}$	.18	.27	.34	.39	.48	.52	.60	.67	.72	.80			
$2\frac{1}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	2	.24	.36	.43	.51	.67	.72	.80	.87	.96	1.03			
$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$2\frac{1}{2}$	.32	.79	.91	1.20	1.30	1.40	1.55	1.68	1.80				
$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	3	.65	.96	1.13	1.44	1.60	1.77	1.93	2.10	2.27				
$3\frac{1}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$3\frac{1}{2}$	1.00	1.40	1.75	1.95	2.15	2.35	2.55	2.75					
3	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	4	1.15	1.60	2.00	2.25	2.50	2.75	3.00						

Add 60 per cent. to above prices for Galvanized Nipples, threaded R. and L.

## WROUGHT NIPPLES.

GALVANIZED RIGHT HAND.

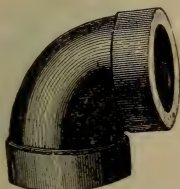
Price List adopted February 15, 1900.

LENGTH IN INCHES						Size.  Inches.	PRICES.		PRICES OF EXTRA LONG GALVANIZED NIPPLES.									
Close	Short.	Long.					Close or Short.	Long.	Lengths in Inches.									
									4	5	6	7	8	9	10	11	12	
$\frac{3}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{8}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34	
$\frac{7}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{3}{16}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34	
1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{1}{2}$	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34	
$1\frac{1}{8}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	$\frac{5}{16}$	.06	.11	.13	.16	.18	.23	.26	.28	.31	.33	.36	
$1\frac{3}{8}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$\frac{3}{4}$	.08	.14	..	.18	.21	.26	.29	.32	.35	.38	.41	
$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	1	.11	.19	..	.24	.28	.34	.38	.42	.47	.51	.55	
$1\frac{3}{4}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$1\frac{1}{4}$	.17	.29	..	.32	.38	.45	.51	.57	.63	.69	.75	
2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	$1\frac{1}{2}$	.21	.35	..	.39	.46	.55	.63	.70	.77	.84	.91	
$2\frac{1}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	2	.27	.47	..	.52	.61	.74	.83	.93	1.03	1.13	1.23	
$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$2\frac{1}{2}$	.56	.86	..	1.00	1.26	1.41	1.56	1.71	1.86	2.01	2.16	
$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	3	.70	1.10	..	1.30	1.60	1.80	2.00	2.20	2.40	2.60	2.80	
3	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$3\frac{1}{4}$	1.20	1.70	..	2.10	2.35	2.60	2.85	3.15	3.40	3.60	3.80	
$3\frac{1}{4}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	4	1.35	1.87	..	2.30	2.60	2.90	3.20	3.50	3.80	4.10	4.40	
3	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	4	1.85	2.60	..	3.30	3.65	4.05	4.45	4.85	5.25	5.65	6.05	
$3\frac{3}{4}$	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	5	2.30	3.15	..	3.75	4.20	4.60	5.00	5.40	5.85	6.25	6.70	
$4\frac{1}{4}$	5	$5\frac{1}{2}$	6	$6\frac{1}{2}$	7	6	2.80	4.25	..	4.50	5.00	5.55	6.05	6.60	7.13	7.65	8.15	
4	5	..	..	..	7	7	4.25	4.95	..	5.65	6.35	7.05	7.75	8.45	9.20	9.95	10.65	
4	5	..	..	..	8	8	5.00	5.80	..	6.65	7.50	8.35	9.25	10.10	10.95	11.85	12.75	

For List on R. and L. Galvanized Nipples, add 60 per cent. to R. and L. Plain Nipples

## CAST IRON FITTINGS.

## ELBOW.



Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Elbows—R. H.....Each	.05	.05	.06	.08	$.10\frac{1}{2}$	.16	.20	.28	.50	.75
Elbows—Right and Left....."	.06	.06	.07	.09	.12	.18	.23	.32	.60	.85
Elbows—Reducing....."		.06	.07	.09	.12	.18	.23	.32	.60	.85
Elbows—Pitched....."				.10	.13	.20	.25	.35	.65	1.00

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Elbows—R. H.....Each	1.05	1.20	1.75	2.00	2.75	4.70	6.75	9.00	13.50	20.00
Elbows—Reducing....."	1.20	1.40	2.00	2.30	3.15	5.40	7.75	10.50	15.50	23.00
Elbows—Pitched....."	1.30	1.50	.....	.....	.....	.....	.....	.....	.....	.....

## REDUCING ELBOW.



## 45° ELBOW.

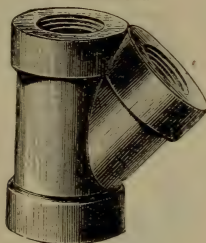


Size.....Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Elbow—45°.....Each	.06	.06	.07	.10	.12	.19	.24	.34	.60	.90
Elbow—Side Outlet....."		..	.18	.24	.30	.48	.60	.84	1.50	2.25
Y Branches....."		..	.20	.28	.34	.54	.66	.94	1.66	2.50

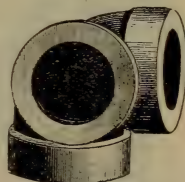
  

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Elbow—45°.....Each	1.25	1.45	2.20	2.50	3.45	5.90	8.50	11.25	17.00	23.00
Elbow—Side Outlet....."	3.15	3.60	5.25	6.00	8.25	.....	.....	.....	.....	.....
Y Branches....."	3.50	4.00	5.90	7.00	9.20	15.60	22.50	.....	45.00	67.00

## Y BRANCH

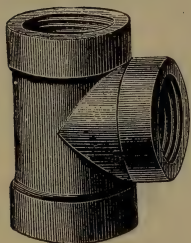


## SIDE OUTLET ELBOW



## CAST IRON FITTINGS.

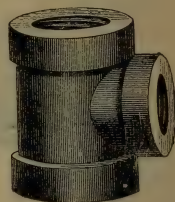
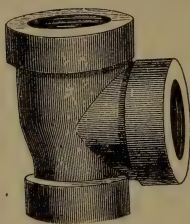
## TEE.



Size.....Inches	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Tees.....Each	.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10
Tees—Reducing on Outlet, "		.09	.10	.14	.17	.27	.33	.47	.83	1.25
Tees—Reducing on Run, "		.09	.10	.14	.17	.27	.33	.47	.83	1.25

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Tees.....Each	1.50	1.75	2.55	3.00	4.00	6.80	9.75	13.00	19.50	29.00
Tees—Reducing on Outlet, "	1.75	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50
Tees—Reducing on Run, "	1.75	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50

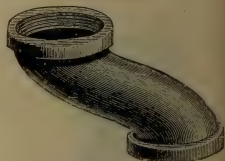
## REDUCING TEES.

REDUCING TEE.  
BULL HEAD.

Size.....Inches	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Tees—Bull Head.....Each	.09	.10	.14	.17	.27	.33	.47	.83	1.25
Tees—with Side Outlet, "		.27	.36	.45	.70	.90	1.25	2.25	3.25

Size.....Inches	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Tees—Bull Head.....Each	1.75	2.00	2.95	3.50	4.60	7.80	11.25	15.00	22.50	33.50
Tees—with Side Outlet, "	4.50	5.25	7.65	9.00	12.00					

## OFFSET.



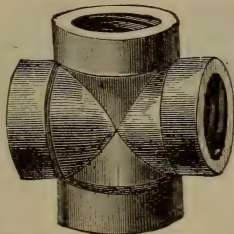
Size.....Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
To offset 4 inches.....Each	.45	.50	1.00	1.20	1.80	3.00	4.00	5.00	6.00	8.00	10.00
To offset 6 ".....	.67	1.03	1.50	1.80	2.70	4.50	6.00	7.50	9.00	12.00	15.00
To offset 8 ".....	.90	1.40	2.00	2.40	3.60	6.00	8.00	10.00	12.00	16.00	20.00

For List of Galvanized, see page 111.



## CAST IRON FITTINGS.

## CROSS.

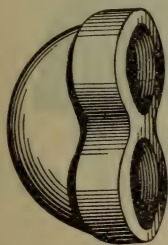


Size .....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Crosses .....	Each	.15	.16	.22	.27	.42	.53	.75	1.30	2.00	2.70
Crosses—Reducing .....	"	.18	.25	.30	.46	.60	.83	1.45	2.20	3.00	
Crosses—Side Outlet .....	"		.36	.48	.60	.94	1.20	1.67	2.07	4.86	6.00

Size .....	Inches	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Crosses .....	Each	3.15	4.60	5.50	7.25	12.25	17.50	23.50	35.00	52.50
Crosses—Reducing .....	"	3.50	5.10	6.00	8.00	13.50	19.25	26.00	38.50	58.00
Crosses—Side Outlet .....	"	7.00	10.21	12.10	16.05	.....	.....	.....	.....	.....

## RETURN BENDS.

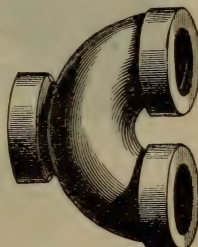
CLOSE.



OPEN.



WITH BACK OUTLET

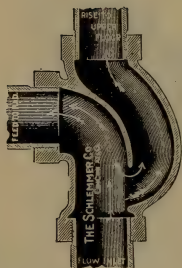


Outlet.

Size .....	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Return Bends—Close .....	Each	18	20	22	28	40	57	1.20	1.70
Return Bends—Open .....	"		26	30	40	55	80	1.35	2.20
Return Bends—Back Outlet .....	"		38	42	60	80	13	2.00	3.00
Return Bends—Close, R. and L. or L. H. ....	"	21	23	26	33	46	66	1.40	1.95
Return Bends—Open, R. and L. or L. H. ....	"		30	35	46	64	92	1.55	2.50
Return Bends—Close Pitched, R. H. ....	"			26	33	.....	.....	.....	.....
Return Bends—Close Pitched, R. and L. or L. H. ....	"			26	33	.....	.....	.....	.....

For List of Galvanized, see page 141.

## CAST IRON FITTINGS.



## THE O. S. DISTRIBUTING FITTING.

MADE IN ALL SIZES, STRAIGHT AND REDUCING.

Inch	1	1¼	1½	2	2½
Each.....	.60	.80	.90	1.20	2.00

## Y BRANCH.



## OFFSET.



## Y BRANCHES—STRAIGHT SIZES.

Inch	½	¾	1	1¼	1½	2	2½	3	3½	4
Each.....	.20	.28	.34	.54	.66	.94	1.66	2.50	3.50	4.00
Inch	4½	5	6	7	8	9	10	12		
Each.....	5.90	7.00	9.20	15.60	22.50	30.00	45.00	67.00		

## REDUCING Y BRANCHES.

Inch	½	¾	1	1¼	1½	2	2½	3	3½	4
Each.....	.23	.33	.40	.62	.76	1.08	1.90	2.90	4.00	4.60
Inch	4½	5	6	7	8	9	10	12		
Each.....	6.80	8.00	10.60	18.00	26.00	35.00	51.75	77.00		

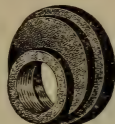
## OFFSETS.

Inch	¾	1	1¼	1½	2	2½	3	3½	4	5	6
To offset 4 inches, each,	.45	.70	1.00	1.20	1.80	3.00	4.00	5.00	6.00	8.00	10.00
" 6 " "	.67	1.05	1.50	1.80	2.70	4.50	6.00	7.50	9.00	12.00	15.00
" 8 " "	.90	1.40	2.00	2.40	3.60	6.00	8.00	10.00	12.00	16.00	20.00

For prices of Galvanized Cast Iron Fittings, see page 141.

## CAST IRON FITTINGS.

REDUCING COUPLING.

REDUCING COUPLING.  
ECCENTRIC.

CAP.



LOCKNUT.



## REDUCING COUPLINGS.

Size of largest opening, inches	2	2½	3	3½	4	4½	5
Each	.43	.60	.80	1.00	1.35	1.85	2.00
Size of largest opening, inches	6	7	8	9	10	12	
Each	2.70	5.35	6.75	8.35	10.00	15.00	

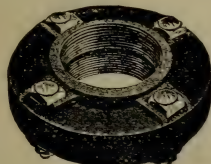
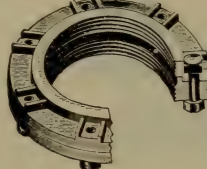
	Inch	2 x 1½	2½ x 1¼	2½ x 1½	2½ x 2	3 x 2	3 x 2½
Each		1.00	1.50	1.50	1.50	2.40	2.40
	Inch	3½ x 3	3½ x 2½	4 x 3½	4 x 3	5 x 4	6 x 4
Each		3.00	3.00	4.00	4.00	6.00	8.00

## CAPS.

	Inch	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Each		.26	.40	.64	.75	.87	1.05	1.20	1.55	2.50	2.85	4.75	5.50	7.00

## LOCKNUTS.

	Inch	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Each		.25	.27	.34	.47	.64	.85	.90	1.30	1.70	2.35	2.70	3.00	4.00

FLANGE UNION.  
PLAIN.FLANGE UNION.  
WITH LIP, FACED.

## PLAIN FLANGE UNION

	Inch	½	¾	1	1¼	1½	2	2½	3	3½
Each		.40	.46	.52	.64	.78	1.00	1.25	1.50	1.80
	Inch	4	4½	5	6	7	8	9	10	12
Each		2.10	2.70	3.15	3.95	5.50	7.00	10.00	11.50	16.00

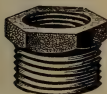
## LIPPED FLANGE UNIONS.

	Inch	½	¾	1	1¼	1½	2	2½	3	3½
Each		.60	.75	.90	1.00	1.20	1.50	1.75	2.00	2.75
	Inch	4	4½	5	6	7	8	9	10	12
Each		3.00	3.50	4.00	5.00	7.00	10.00	15.00	17.50	20.00

For prices of Galvanized Cast Iron Fittings, see page 141.

## CAST IRON FITTINGS

BUSHING.



FACED BUSHING.



ECCENTRIC BUSHING.



## PLAIN BUSHINGS.

	Inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
U-87. Each.....		.04	.04	.05	.06	.07	.09	.14	.21	.30	.40
	Inch	4	$4\frac{1}{2}$	5	6	7	8	9	10	12	
U-87. Each.....		.50	.75	.93	1.25	1.87	2.75	3.25	3.75	5.00	

Bushings up to  $2\frac{1}{2}$  inch, inclusive, which reduce one size only, are malleable.

## FACED BUSHINGS.

	Inch	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
U-88. Each.....		.08	.09	.11	.13	.17	.22	.32	.48	.70	1.20	1.50

## ECCENTRIC BUSHINGS.

	Inch	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
U-89. Each.....		.27	.42	.60	.80	1.00	1.50	1.85	2.50	3.75	5.50	6.50	7.50	10.00

PLUG.



COUNTERSUNK PLUG.



## PLAIN PLUGS.

	Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
U-90. Each.....		.02	.02	.02	.03	.04	.05	.07	.10	.18	.25
	Inch	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
U-90. Each.....		.38	.42	.65	.88	1.20	1.85	2.75	3.25	3.75	5.00

## COUNTERSUNK PLUGS.

	Inch	$\frac{1}{4}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
U-91. Each.....		.04	.06	.08	.09	.11	.15

## PLAIN PLUGS, LEFT HAND.

	Inch	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Each.....		.06	.08	.09	.11	.15



## CAR HEATER FITTINGS.

EXTRA HEAVY.

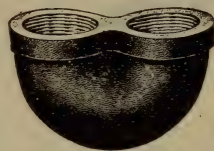
ELBOW.



TEE.



RETURN BEND.



## ELBOWS.

	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, each.....		.22	.25	.27	.30	.45	.45	.55
Right and Left, each.....		.22	.25	.27	.30	.45	.45	.55

## TEES.

	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4} \times \frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	$1\frac{1}{4} \times 1\frac{1}{4} \times 1\frac{1}{2}$	$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	2
Each.....		.30	.35	.40	.45	.45	.45	.45	.65	.85

## RETURN BENDS.

	Inch	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{4}$
Center to Center, inches..		$2\frac{3}{8}$	3	4	5	$7\frac{1}{2}$	8
Each.....		.45	.50	.60	.70	1.10	1.10

CAST IRON COUPLING.



WROUGHT IRON COUPLING.



## CAST IRON COUPLINGS.

	Inch	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, each.....		.25	.30	.45	.55
Right and Left, each.....		.35	.40	.55	.65

## WROUGHT IRON COUPLINGS.

	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Right Hand, each.....		.14	.20	.26	.34	.42	.56
Right and Left, each.....		.20	.30	.40	.45	.55	.70

## CAST IRON FITTINGS.

EXTRA HEAVY.



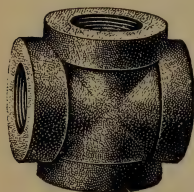
ELBOW-Ex. Heavy



45° ELBOW-Ex. Heavy.



TEE-Ex. Heavy.



CROSS-Ex. Heavy.



FLANGE UNION-Ex. Heavy.



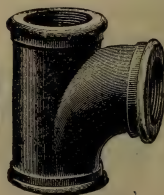
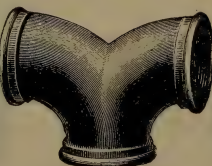
COUPLING-Ex. Heavy.

## SPECIAL LONG TURN FITTINGS.

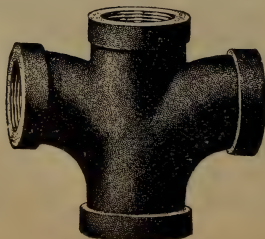
NO. 1.

NO. 2.

NO. 3.



CROSS.



## CAST IRON FITTINGS.

## EXTRA HEAVY.

Size	Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Elbows	Each	.30	.35	.45	.60	.75	1.25	2.00	2.75
Elbows—Reducing	"	.40	.45	.55	.75	.95	1.55	2.50	3.40
Elbows—45°	"	.40	.45	.55	.70	.90	1.50	2.50	3.50
Tees	"	.50	.55	.70	.90	1.15	1.80	3.00	4.25
Tees—Reducing	"	.65	.70	.90	1.15	1.40	2.25	3.75	5.30

Size	Inches	4	$4\frac{1}{2}$	5	6	7	8	10	12
Elbows	Each	3.50	4.25	5.50	8.00	12.00	17.00	28.00	40.00
Elbows—Reducing	"	4.40	5.30	6.80	10.00	15.00	21.00	35.00	50.00
Elbows—45°	"	4.50	5.50	6.75	9.75	14.50	21.00	34.00	48.00
Tees	"	5.30	6.75	8.25	12.00	18.00	25.00	42.00	60.00
Tees—Reducing	"	6.85	8.50	10.25	15.00	22.50	31.00	52.00	75.00

Size	Inches	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Crosses	Each	.65	.70	.90	1.20	1.50	2.50	4.00	5.50
Crosses—Reducing	"	.85	.90	1.15	1.50	1.85	3.15	5.00	6.85
Flange Unions	"	.70	.80	1.00	1.15	1.50	1.90	2.25	2.70
Couplings	"	.25	.30	.45	.55	.65	.....	.....	.....
Couplings—Right and Left	"	.35	.40	.55	.65	.....	.....	.....	.....

Size	Inches	4	$4\frac{1}{2}$	5	6	7	8	10	12
Crosses	Each	7.00	8.50	11.00	16.00	24.00	34.00	56.00	80.00
Crosses—Reducing	"	8.75	10.00	13.75	20.00	30.00	42.00	70.00	100.00
Flange Unions	"	3.15	4.00	4.75	6.00	8.35	10.50	...	...

## Long Turn Elbows.

		ELBOWS.							
Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Straight	Each	.32	.40	.55	.80	1.20	2.25	3.25	3.50
Reducing	"	.48	.60	.83	1.20	1.80	3.38	4.88	5.25
Size	Inches	$4\frac{1}{2}$	5	6	7	8	9	10	12
Straight	Each	5.50	6.50	8.75	13.00	17.00	25.50	30.00	40.00
Reducing	"	8.25	9.75	13.13	19.50	25.50	38.25	45.00	60.00

## Long Turn Double Branch Elbows.

		LONG TURN DOUBLE BRANCH ELBOWS.							
Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Straight	Each	.64	.80	1.10	1.60	2.40	4.50	6.50	7.00
Reducing	"	.96	1.20	1.65	2.40	3.60	6.75	9.75	10.50
Size	Inches	$4\frac{1}{2}$	5	6	7	8	9	10	12
Straight	Each	11.00	13.00	17.50	26.00	34.00	51.00	60.00	80.00
Reducing	"	16.50	19.50	26.25	39.00	51.00	76.50	90.00	120.00

## Long Turn Tees.

		TEES.							
Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Straight	Each	.48	.60	.82	1.20	1.80	3.40	4.90	5.25
Reducing	"	.72	.90	1.23	1.80	2.70	5.10	7.35	7.88
Size	Inches	$4\frac{1}{2}$	5	6	7	8	9	10	12
Straight	Each	8.25	9.75	13.25	19.50	25.50	38.00	45.00	60.00
Reducing	"	12.38	14.63	19.88	29.25	38.25	57.00	67.50	90.00

## Long Turn Cross.

		LONG TURN CROSS.							
Size	Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Each		.85	1.10	1.50	2.15	3.20	6.00	8.75	9.50
Size	Inches	$4\frac{1}{2}$	5	6	7	8	9	10	12
Each		15.00	17.50	24.00	35.00	45.00	68.00	80.00	107.00

## BRANCH TEES.



No. 1. FOR CIRCULATION.



No. 2. FOR CIRCULATION.



No. 3. FOR BOX COILS.

All Openings in Branch Tees for Circulation are tapped Right hand.

Branch Tees for Box Coils are always tapped Left hand in branches and Right hand in back inlet.

The run and back opening of Branch Tees are tapped the same size as branches unless otherwise ordered.

## 1 Inch Branches, 2½ Inch Center to Center.

Number of Branches.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1-inch or 1½-inch run, each .....	90	105	115	135	160	190	220	265	315	375	440	500	560	700	760	800
1½-inch run, each.....	100	115	130	145	175	220	245	290	330	450	475	550	600	725	775	825
2-inch run, each.....	115	135	160	185	210	245	275	340	400	480	510	600	725	775	825	
2½-inch run, each.....	175	205	240	275	310	360	375	430	500	560	685	680				

## 1½ Inch Branches, 3 Inch Center to Center.

Number of Branches.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1½-inch or 2-inch run, each .....	130	165	200	240	280	320	360	430	480	500	525	560	600	625	650	700
2-inch run, each.....	150	190	240	290	330	390	450	525	585	625	685	725	785	825		
2½-inch run, each.....	195	240	285	355	395	420	495	615	685	725	785	825				

## 1½ Inch Branches 3½ Inch Center to Center.

Number of Branches.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1½-inch or 2-inch run, each .....	210	270	335	400	465	525	585	650	700	825	925	975	1050	1150		
2-inch run, each.....	285	345	415	500	575	650	725	775	900	1000	1075	1160	1275			
2½-inch run, each.....	315	380	460	550	625	725	775	900	1000	1075	1160	1275				

## 2 Inch Branches 4½ Inch Center to Center.

Number of Branches.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2-inch run, each.....	410	525	640	765	880	1060	1150	1225	1360	1425	1500	1600	1600			
2½-inch run, each.....	450	575	700	850	975	1175	1275	1350	1500	1575	1650	1750	1750			
3-inch run, each.....	460	575	700	850	975	1175	1275	1350	1500	1575	1650	1750	1750			
3½-inch run, each.....	500	625	775	925	1075	1300	1400	1500	1650							

## Foot Valves and Strainers.



Foot Valve with Strainer.



Strainer.

## Foot Valves with Strainer—Screwed.

Size, inches.....	1	1½	1¾	2	2½	3	3½	4	4½	5	6	7	8	10	12	
Price, each.....	\$1 15	1 80	1 40	1 90	2 40	3 30	3 80	5 60	7 30	10 50	11 25	14 75	35 00	41 00	64 00	100 00

## Foot Valves with Strainer—Flanged.

Size, inches.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16
Price, each.....	\$3 50	4 50	5 75	7 50	9 50	13 00	14 00	17 50	38 00	45 00	70 00	112 00	150 00	200 00
Diam. of Flanges, in. 6.....	7	7½	8½	9	9½	10	11	12½	13½	16	19	21	23½	

## Iron Strainers.

Size, inches.....	1	1½	2	2½	3	3½	4	4½	5	6	8		
Painted.....	\$0 22	25	33	44	55	82	1 10	1 75	2 00	2 30	2 50	3 50	7 50
Galvanized.....	30	34	43	58	80	1 20	1 70	2 60	3 00	3 50	3 90	5 00	11 00



## GALVANIZED CAST IRON FITTINGS.

Size.	Inches	1-4	3-8	1-2	3-4	1	1 1-4	1 1-2	2	2 1-2	3
Elbows, R. H.	Each	\$ .10	\$ .10	\$ .12	\$ .16	\$ .21	\$ .32	\$ .40	\$ .56	\$1.00	\$1.50
45° Elbows	"	.12	.12	.14	.20	.24	.38	.48	.68	1.20	1.80
Reducing Elbows	"	"	.12	.14	.18	.24	.36	.48	.64	1.20	1.70
Tees	"	.16	.16	.18	.24	.30	.46	.58	.82	1.46	2.20
Reducing Tees	"	"	.18	.20	.28	.34	.54	.68	.94	1.66	2.50
Crosses	"	"	.30	.32	.44	.54	.84	1.06	1.50	2.60	4.00
Return Bends, Close	"	"	"	.36	.40	.44	.56	.80	1.14	2.40	3.40
Return Bends, Open	"	"	"	.52	.60	.80	1.10	1.60	2.70	4.40	6.00
Return Bends, Back Outlet	"	"	"	.76	.84	1.20	1.60	2.30	4.00	6.00	8.00
Flange Unions	"	"	"	.80	.92	1.04	1.28	1.56	2.00	2.60	3.00
Flange Unions, Lip	"	"	"	1.00	1.25	1.50	1.65	2.00	2.60	2.90	3.35
Caps, Cast Iron	"	"	"	"	"	"	"	.62	.80	1.08	1.08
Reducers, Cast Iron	"	"	"	"	"	"	"	.86	1.20	1.60	1.60
Locknuts, Cast Iron	"	"	"	"	"	"	"	.50	.54	.68	.68
Y Bends	"	"	"	.40	.56	.68	1.08	1.32	1.88	3.32	5.00
Cast Iron Offsets, to offset 4 inches	"	"	"	"	.90	1.40	2.00	2.40	3.60	6.00	8.00
Cast Iron Offsets, to offset 6 inches	"	"	"	"	1.34	2.10	3.00	3.60	5.40	9.00	12.00
Cast Iron Offsets, to offset 8 inches	"	"	"	"	1.80	2.80	4.00	4.80	7.20	12.00	16.00
Bushings	"	"	.08	.08	.10	.12	.14	.18	.28	.42	.60
Plugs	"	.04	.04	.04	.06	.08	.10	.14	.20	.36	.50
Malleable-Iron Unions	"	.27	.30	.33	.40	.50	.70	.90	1.15	2.35	3.15
Malleable Iron Union Ells, Female	"	"	"	.68	.81	.95	1.35	1.58	2.35	4.30	4.30
Malleable Iron Union Tees, Female	"	"	"	.86	1.05	1.45	1.75	2.55	4.80	4.80	4.80
Malleable Iron Union Ells, Male and Female	"	"	"	.72	.93	1.08	1.60	1.80	2.70	4.95	4.95
Malleable Iron Union Tees, Male and Female	"	"	"	.78	1.00	1.20	1.65	1.95	2.95	5.55	5.55
Malleable Iron Flange Unions	"	"	"	2.50	2.80	3.20	4.00	5.00	6.00	7.00	8.80
Longscrews	"	.35	.40	.50	.66	1.00	1.25	1.60	2.10	3.10	4.70

[illegible]

## LIST OF STANDARD SIZES

OF

## CAST IRON FITTINGS.

## STRAIGHT SIZES.

Elbows and Tees— $\frac{1}{4}$  to 12 inch.  
 Elbows, 45°— $\frac{3}{8}$  to 12 inch.  
 Return Bends— $\frac{1}{2}$  to 3 inch.  
 Caps and Locknuts—2 to 12 inch.  
 Y Branches— $\frac{1}{2}$  to 10 inch.

Elbows, Right and Left— $\frac{1}{4}$  to 3 inch.  
 Crosses— $\frac{3}{8}$  to 12 inch.  
 Offsets— $\frac{3}{4}$  to 6, to offset 4 in., 6 in. and 8 inch.  
 Plugs— $\frac{1}{4}$  to 12 inch.  
 Flange Unions— $\frac{1}{2}$  to 12 inch.

## REDUCING ELBOWS.

$\frac{1}{2} \times \frac{3}{8}$	$1\frac{1}{2} \times 1\frac{1}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	$4\frac{1}{2} \times 4$
$\frac{3}{4} \times \frac{1}{2}$	$1\frac{1}{2} \times 1$	$3 \times 2\frac{1}{2}$	$5 \times 4$
$1 \times \frac{3}{4}$	$1\frac{1}{2} \times \frac{3}{4}$	$3 \times 2$	$6 \times 5$
$1 \times \frac{1}{2}$	$2 \times 1\frac{1}{2}$	$3\frac{1}{2} \times 3$	$6 \times 4$
$1\frac{1}{4} \times 1$	$2 \times 1\frac{1}{4}$	$4 \times 3\frac{1}{2}$	$8 \times 6$
$1\frac{1}{4} \times \frac{3}{4}$	$2 \times 1$	$4 \times 3$	
$1\frac{1}{4} \times \frac{1}{2}$	$2\frac{1}{2} \times 2$	$4 \times 2\frac{1}{2}$	

## REDUCING COUPLINGS.

$2\frac{1}{2} \times 2$	$3\frac{1}{2} \times 2\frac{1}{2}$	$4\frac{1}{2} \times 4$	$6 \times 3$
$2\frac{1}{2} \times 1\frac{1}{2}$	$4 \times 3\frac{1}{2}$	$5 \times 4$	$7 \times 6$
$3 \times 2\frac{1}{2}$	$4 \times 3$	$5 \times 3$	$8 \times 6$
$3 \times 2$	$4 \times 2\frac{1}{2}$	$6 \times 5$	$10 \times 8$
$3\frac{1}{2} \times 3$	$4 \times 2$	$6 \times 4$	$12 \times 10$

## REDUCING TEES.

## REDUCING ON OUTLET.

$\frac{1}{2} \times \frac{3}{8}$	$2 \times \frac{3}{4}$	$3\frac{1}{2} \times 1\frac{1}{2}$	$5 \times 4$	$8 \times 6$
$\frac{3}{4} \times \frac{1}{2}$	$2 \times \frac{1}{2}$	$3\frac{1}{2} \times 1\frac{1}{4}$	$5 \times 3\frac{1}{2}$	$8 \times 5$
$\frac{3}{4} \times \frac{3}{8}$	$2\frac{1}{2} \times 2$	$3\frac{1}{2} \times 1$	$5 \times 3$	$8 \times 4$
$1 \times \frac{3}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	$4 \times 3\frac{1}{2}$	$5 \times 2\frac{1}{2}$	$8 \times 3\frac{1}{2}$
$1 \times \frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{4}$	$4 \times 3$	$5 \times 2$	$8 \times 3$
$1 \times \frac{3}{8}$	$2\frac{1}{2} \times 1$	$4 \times 2\frac{1}{2}$	$5 \times 1\frac{1}{2}$	$8 \times 2\frac{1}{2}$
$1\frac{1}{4} \times 1$	$2\frac{1}{2} \times \frac{3}{4}$	$4 \times 2$	$5 \times 1\frac{1}{4}$	$8 \times 2$
$1\frac{1}{4} \times \frac{3}{4}$	$3 \times 2\frac{1}{2}$	$4 \times 1\frac{1}{2}$	$6 \times 5$	$10 \times 8$
$1\frac{1}{4} \times \frac{1}{2}$	$3 \times 2$	$4 \times 1\frac{1}{4}$	$6 \times 4$	$10 \times 6$
$1\frac{1}{2} \times 1\frac{1}{4}$	$3 \times 1\frac{1}{2}$	$4 \times 1$	$6 \times 3\frac{1}{2}$	$10 \times 5$
$1\frac{1}{2} \times 1$	$3 \times 1\frac{1}{4}$	$4 \times \frac{3}{4}$	$6 \times 3$	$10 \times 4$
$1\frac{1}{2} \times \frac{3}{4}$	$3 \times 1$	$4\frac{1}{2} \times 4$	$6 \times 2\frac{1}{2}$	$12 \times 10$
$1\frac{1}{2} \times \frac{1}{2}$	$3 \times \frac{3}{4}$	$4\frac{1}{2} \times 3\frac{1}{2}$	$6 \times 2$	$12 \times 8$
$2 \times 1\frac{1}{2}$	$3\frac{1}{2} \times 3$	$4\frac{1}{2} \times 3$	$7 \times 6$	$12 \times 6$
$2 \times 1\frac{1}{4}$	$3\frac{1}{2} \times 2\frac{1}{2}$	$4\frac{1}{2} \times 2\frac{1}{2}$	$7 \times 5$	
$2 \times 1$	$3\frac{1}{2} \times 2$	$4\frac{1}{2} \times 2$	$7 \times 4$	

## CAST IRON FITTINGS-CONTINUED

## REDUCING TEES.

## REDUCING ON RUN

[illegible]

## CAST IRON FITTINGS—CONTINUED.

## REDUCING TEES.

## BULL HEAD.

$\frac{3}{8} \times \frac{1}{2}$	1 x 2	2 x 3	4 x 6
$\frac{1}{2} \times 1$	1 x $1\frac{1}{2}$	2 x $2\frac{1}{2}$	4 x 5
$\frac{1}{2} \times \frac{3}{4}$	1 x $1\frac{1}{4}$	$2\frac{1}{2} \times 4$	5 x 6
$\frac{3}{4} \times 2$	$1\frac{1}{4} \times 2$	$2\frac{1}{2} \times 3$	6 x 8
$\frac{3}{4} \times 1\frac{1}{2}$	$1\frac{1}{4} \times 1\frac{1}{2}$	3 x 4	6 x 7
$\frac{3}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times 2\frac{1}{2}$	3 x $3\frac{1}{2}$	
$\frac{3}{4} \times 1$	$1\frac{1}{2} \times$	$3\frac{1}{2} \times 4$	

## REDUCING CROSSES.

$\frac{1}{2} \times \frac{3}{8}$	2 x $1\frac{1}{4}$	$3\frac{1}{2} \times 3$	6 x 3
$\frac{1}{2} \times \frac{1}{4}$	2 x 1	$3\frac{1}{2} \times 2\frac{1}{2}$	6 x $2\frac{1}{2}$
$\frac{3}{4} \times \frac{3}{8}$	2 x $\frac{3}{4}$	$3\frac{1}{2} \times 2$	6 x 2
$\frac{3}{4} \times \frac{1}{2}$	$2\frac{1}{2} \times 2$	4 x $3\frac{1}{2}$	7 x 6
1 x $\frac{3}{4}$	$2\frac{1}{2} \times 1\frac{1}{2}$	4 x 3	7 x 5
1 x $\frac{1}{2}$	$2\frac{1}{2} \times 1\frac{1}{4}$	4 x $2\frac{1}{2}$	8 x 7
$1\frac{1}{4} \times 1$	$2\frac{1}{2} \times 1$	4 x 2	8 x 6
$1\frac{1}{4} \times \frac{3}{4}$	$2\frac{1}{2} \times \frac{3}{4}$	5 x 4	10 x 8
$1\frac{1}{4} \times \frac{1}{2}$	3 x $2\frac{1}{2}$	5 x 3	10 x 7
$1\frac{1}{2} \times 1\frac{1}{4}$	3 x 2	5 x $2\frac{1}{2}$	12 x 10
$1\frac{1}{2} \times 1$	3 x $1\frac{1}{2}$	5 x 2	12 x 8
$1\frac{1}{2} \times \frac{3}{4}$	3 x $1\frac{1}{4}$	6 x 5	
$1\frac{1}{2} \times \frac{1}{2}$	3 x 1	6 x 4	
2 x $1\frac{1}{2}$	3 x $\frac{3}{4}$	6 x $3\frac{1}{2}$	

## BUSHINGS

$\frac{1}{2} \times \frac{1}{4}$	2 x $\frac{1}{2}$	$3\frac{1}{2} \times 1$	5 x 3	7 x $2\frac{1}{2}$
$\frac{3}{4} \times \frac{3}{8}$	$2\frac{1}{2} \times 1\frac{1}{2}$	4 x $3\frac{1}{2}$	5 x $2\frac{1}{2}$	7 x 2
$\frac{3}{4} \times \frac{1}{4}$	$2\frac{1}{2} \times 1\frac{1}{4}$	4 x 3	5 x 2	8 x 7
1 x $\frac{1}{2}$	$2\frac{1}{2} \times 1$	4 x $2\frac{1}{2}$	6 x 5	8 x 6
1 x $\frac{3}{8}$	$2\frac{1}{2} \times \frac{3}{4}$	4 x 2	6 x $4\frac{1}{2}$	8 x 5
1 x $\frac{1}{4}$	3 x $2\frac{1}{2}$	4 x $1\frac{1}{2}$	6 x 4	8 x 4
$1\frac{1}{4} \times \frac{3}{4}$	3 x 2	4 x $1\frac{1}{4}$	6 x $3\frac{1}{2}$	8 x 3
$1\frac{1}{4} \times \frac{1}{2}$	3 x $1\frac{1}{2}$	4 x 1	6 x 3	9 x 8
$1\frac{1}{4} \times \frac{3}{8}$	3 x $1\frac{1}{4}$	$4\frac{1}{2} \times 4$	6 x $2\frac{1}{2}$	9 x 7
$1\frac{1}{2} \times 1$	3 x 1	$4\frac{1}{2} \times 3\frac{1}{2}$	6 x 2	9 x 6
$1\frac{1}{2} \times \frac{3}{4}$	$3\frac{1}{2} \times 3$	$4\frac{1}{2} \times 3$	7 x 6	10 x 8
$1\frac{1}{2} \times \frac{1}{2}$	$3\frac{1}{2} \times 2\frac{1}{2}$	$4\frac{1}{2} \times 2\frac{1}{2}$	7 x 5	10 x 6
2 x $1\frac{1}{4}$	$3\frac{1}{2} \times 2$	5 x $4\frac{1}{2}$	7 x $4\frac{1}{2}$	12 x 10
2 x 1	$3\frac{1}{2} \times 1\frac{1}{2}$	5 x 4	7 x 4	12 x 8
2 x $\frac{3}{4}$	$3\frac{1}{2} \times 1\frac{1}{4}$	5 x $3\frac{1}{2}$	7 x $3\frac{1}{2}$	12 x 6
			7 x 3	

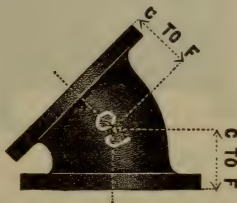


# STANDARD FLANGED FITTINGS

FOR 125 POUNDS WORKING PRESSURE



FLANGED ELBOWS



FLANGED ELBOWS

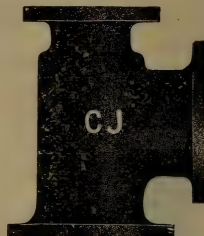
Size.	Center to Face.	Diam. of Flanges.	PRICE.		Size.	Center to Face.	Diam. of Flanges.	PRICE.	
			With Faced Flanges. Each.	With Faced and Drilled Flanges. Each.				With Faced Flanges. Each.	With Faced and Drilled Flanges. Each.
Inches.	Inches.	Inches.			Inches.	Inches.	Inches.		
2	4½	6	4.75	5.75	2	2½	6	5.25	6.25
2½	5	7	5.00	6.25	2½	3	7	5.50	6.75
3	5½	7½	5.75	7.00	3	3	7½	6.25	7.50
3½	6	8½	6.50	7.75	3½	3½	8½	7.25	8.50
4	6½	9	7.25	9.25	4	4	9	8.00	10.00
4½	7	9¼	9.00	11.00	4½	4	9¼	10.00	12.00
5	7½	10	9.75	11.75	5	4½	10	10.75	12.75
6	8	11	12.00	14.00	6	5	11	13.00	15.00
7	8½	12½	16.00	19.75	7	5½	12½	16.00	19.75
8	9	13½	20.00	23.75	8	5½	13½	20.00	23.75
9	10	15	26.00	30.00	9	6	15	26.00	30.00
10	11	16	32.00	36.00	10	6½	16	32.00	36.00
12	12	19	44.00	50.00	12	7½	19	44.00	50.00
14	14	21	58.00	65.00	14	7½	21	58.00	65.00
16	15	23½	84.00	93.00	16	8	23½	84.00	93.00

NOTE.—Larger sizes made to order. Prices on application. Flanged Fittings will always be furnished faced only, unless otherwise ordered.

**STANDARD**  
**FLANGED FITTINGS**  
 FOR 125 POUNDS WORKING PRESSURE



**FLANGED TEES**



**REDUCING**  
**FLANGED TEES**  
 REDUCING IN RUN OR BRANCH

Size.	Center to Face.	Face to Face.	Diameter of Flanges.	PRICE.		Size.	PRICE.	
				With Faced Flanges.	With Faced and Drilled Flanges.		With Faced Flanges.	With Faced and Drilled Flanges.
Inches.	Inches.	Inches.	Inches.	Each.	Each.	Inches.	Each.	Each.
2	4½	9	6	7.00	8.50			
2½	5	10	7	7.25	9.00	2½	8.25	10.00
3	5½	11	7½	8.25	10.00	3	9.50	11.25
3½	6	12	8½	9.50	11.25	3½	11.00	12.75
4	6½	13	9	10.50	13.50	4	12.00	15.00
4½	7	14	9½	13.00	16.00	4½	15.00	18.00
5	7½	15	10	14.25	17.25	5	16.25	19.25
6	8	16	11	17.50	20.50	6	20.00	23.00
7	8½	17	12½	23.00	28.75	7	26.50	32.00
8	9	18	13½	29.00	34.75	8	33.50	39.00
9	10	20	15	38.00	44.00	9	43.50	50.00
10	11	22	16	46.50	52.50	10	53.50	60.00
12	12	24	19	64.00	73.00	12	74.00	83.00
14	14	28	21	84.00	95.00	14	96.00	107.00
16	15	30	23½	122.00	135.00	16	140.00	153.00

NOTE.—Larger sizes made to order. Prices on application. Flanged fittings will always be furnished, faced only, unless otherwise ordered.

For dimensions of Reducing Flanged Tees, see pages 16, 17.

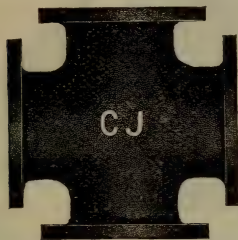
Template for drilling, see page 20.

**REDUCING FLANGED TEES.**

A MODERATE ASSORTMENT OF REDUCING TEES IS CARRIED IN STOCK. TO OVERCOME THE DELAY IN FILLING ORDERS FOR SUCH SIZES AS ARE NOT CARRIED IN STOCK, WE CAN USE THE REDUCING FLANGES WITH RIBS

# STANDARD FLANGED FITTINGS

FOR 125 POUNDS WORKING PRESSURE



## FLANGED CROSSES

REDUCING  
FLANGED CROSSES

Size.	Face to Face.	Diameter of Flanges.	PRICE.		Size.	PRICE.	
			With Faced Flanges.	With Faced and Drilled Flanges.		With Faced Flanges.	With Faced and Drilled Flanges.
Inches.	Inches.	Inches.	Each.	Each.	Inches.	Each.	Each.
2	9	6	9.50	11.50			
2½	10	7	10.00	12.50	2½	11.50	14.00
3	11	7½	11.50	14.00	3	13.25	15.75
3½	12	8½	13.00	15.50	3½	15.00	17.50
4	13	9	14.50	18.50	4	16.75	20.75
4½	14	9½	18.00	22.00	4½	20.75	25.00
5	15	10	19.50	23.50	5	22.50	26.50
6	16	11	24.00	28.00	6	27.50	31.50
7	17	12½	32.00	39.50	7	37.00	45.00
8	18	13½	40.00	47.50	8	46.00	53.50
9	20	15	52.00	60.00	9	60.00	68.00
10	22	16	64.00	72.00	10	74.00	82.00
12	24	19	88.00	100.00	12	100.00	112.00
14	28	21	116.00	130.00	14	132.00	146.00
16	30	23½	168.00	186.00	16	193.00	210.00

NOTE.—Larger sizes made to order. Prices on application. Flanged Fittings will always be furnished faced only, unless otherwise ordered.

**STANDARD  
FLANGED FITTINGS  
FOR 125 POUNDS WORKING PRESSURE**

**FLANGED LATERALS****REDUCING  
FLANGED LATERALS**

Size. Inches.	Diam- eter of Flanges. Inches.	PRICE.		Size. Inches.	PRICE.	
		With Faced Flanges Each.	With Faced and Drilled Flanges. Each.		With Faced Flanges. Each.	With Faced and Drilled Flanges. Each.
4	9	14.50	18.50	4	16.75	20.75
4½	9¼	18.00	22.00	4½	20.75	25.00
5	10	19.50	23.50	5	22.50	26.50
6	11	24.00	28.00	6	27.50	31.50
7	12½	32.00	39.50	7	37.00	45.00
8	13½	40.00	47.50	8	46.00	53.50
9	15	52.00	60.00	9	60.00	68.00
10	16	64.00	72.00	10	74.00	82.00
12	19	88.00	100.00	12	100.00	112.00
14	21	116.00	130.00	14	132.00	146.00
16	23½	168.00	186.00	16	193.00	210.00

NOTE.—Larger sizes made to order. Prices on application. Flanged Fittings will always be furnished faced only, unless otherwise ordered.

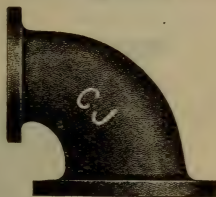
For dimensions of Flanged Laterals, see page 18.

Reducing Flanged Laterals being made to order we are unable to give dimensions.

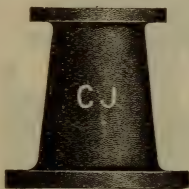


# STANDARD FLANGED FITTINGS

FOR 125 POUNDS WORKING PRESSURE



**FLANGED REDUCING TAPER  
ELBOWS**



**FLANGED TAPER  
REDUCERS**

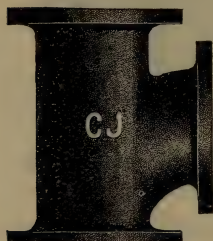
Size.	Center to Face.	Diameter of Flanges.	PRICE.		Size.	Face to Face.	PRICE	
			Faced Flanges.	Faced and Drilled Flanges.			Faced Flanges.	Faced and Drilled Flanges.
Inches.	Inches.	Inches.	Each.	Each.	Inches.	Inches.	Each.	Each.
4 × 2	6½	9 × 6	14.50	18.50	8			
4 × 2½	6½	9 × 7	14.50	18.50				
4 × 3	6½	9 × 7½	14.50	18.50	9			
5 × 2½	7½	10 × 7	19.50	23.50				
5 × 3	7½	10 × 7½	19.50	23.50	10			
5 × 4	7½	10 × 9	19.50	23.50	12			
6 × 3½	8	11 × 8½	24.00	28.00				
6 × 4	8	11 × 9	24.00	28.00	14			
6 × 5	8	11 × 10	24.00	28.00	16			
7 × 5	8½	12½ × 10	32.00	39.50				
7 × 6	8½	12½ × 11	32.00	39.50				
8 × 5	9	13½ × 10	40.00	47.50				
8 × 6	9	13½ × 11	40.00	47.50				
10 × 6	11	16 × 11	64.00	72.00				
10 × 8	11	16 × 13½	64.00	72.00				
12 × 8	12	19 × 13½	88.00	100.00				
12 × 10	12	19 × 16	88.00	100.00				
14 × 10	14	21 × 16	116.00	130.00				
14 × 12	14	21 × 19	116.00	130.00				
16 × 12	15	23½ × 19	168.00	186.00				
16 × 14	15	23½ × 21	168.00	186.00				

Owing to the variation in lengths and reductions of Flanged Taper Reducers, we are unable to publish dimensions or prices.

Flanged Taper Reducing Elbows not listed above will be made to order at a special price.

# **STANDARD** **FLANGED FITTINGS**

FOR 125 POUNDS WORKING PRESSURE



**SINGLE SWEEP  
FLANGED TEES**

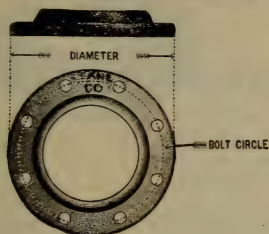


**REDUCING  
SINGLE SWEEP  
FLANGED TEES**  
REDUCING IN RUN OR BRANCH

Size.	Center to Face.	Face to Face.	Diameter of Flanges.	PRICE		Size.	PRICE	
				With Faced Flanges. Each.	With Faced and Drilled Flanges. Each.		With Faced Flanges. Each.	With Faced and Drilled Flanges. Each.
Inches.	Inches.	Inches.	Inches.			Inches.		
2	4½	9	6	8.00	9.50			
2½	5	10	7	8.25	10.00	2½	9.50	11.25
3	5½	11	7½	9.50	11.25	3	11.00	12.75
3½	6	12	8½	11.00	12.75	3½	12.50	14.25
4	6½	13	9	12.00	15.00	4	13.75	16.75
4½	7	14	9½	15.00	18.00	4½	17.25	20.25
5	7½	15	10	16.25	19.25	5	18.75	21.75
6	8	16	11	20.00	23.00	6	23.00	26.00
7	8½	17	12½	26.50	32.00	7	30.00	35.50
8	9	18	13½	33.50	39.00	8	38.50	44.00
9	10	20	15	43.50	50.00	9	50.00	56.50
10	11	22	16	53.50	60.00	10	61.50	68.00
12	12	24	19	74.00	83.00	12	85.00	94.00
14	14	28	21	96.00	107.00	14	110.00	121.00
16	15	30	23½	140.00	153.00	16	160.00	173.00

NOTE.—Larger sizes made to order. Prices on application. Flanged Fittings will always be furnished faced only, unless otherwise ordered.  
Single Sweep Tees with the side opening larger than the run we do not make.

**COMPANION FLANGES**  
FOR STANDARD  
**VALVES AND FLANGED FITTINGS**  
FOR 125 POUNDS WORKING PRESSURE



**BLIND FLANGES**  
16 INCHES AND UNDER

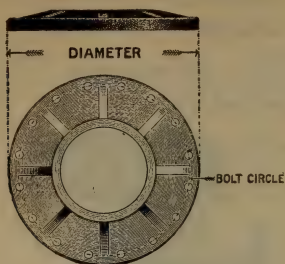


**BLIND FLANGES**  
19 INCHES AND LARGER

**FACED FLANGES****BOLTS****FACED BLIND FLANGES**

Size. Inches.	PRICE.		Price of Bolts per Set for one Joint.	Size. Inches.	PRICE.	
	Faced. Each.	Faced and Drilled. Each.			Faced. Each.	Faced and Drilled. Each.
2 × 6	1.20	1.50	.25	2 × 6	1.40	1.70
2½ × 7	1.40	2.00	.25	2½ × 7	1.60	2.20
3 × 7½	1.60	2.25	.25	3 × 7½	1.85	2.50
3½ × 8½	1.80	2.50	.25	3½ × 8½	2.10	2.80
4 × 9	2.15	3.00	.50	4 × 9	2.50	3.35
4½ × 9½	2.50	3.35	.50	4½ × 9½	2.90	3.75
5 × 10	2.80	3.65	.50	5 × 10	3.25	4.10
6 × 11	3.20	4.00	.50	6 × 11	3.70	4.50
7 × 12½	4.35	5.75	.75	7 × 12½	5.00	6.40
8 × 13½	5.00	6.50	.75	8 × 13½	5.75	7.25
9 × 15	6.75	8.25	1.15	9 × 15	7.75	9.25
10 × 16	7.75	9.25	1.15	10 × 16	9.00	10.60
12 × 19	10.50	12.50	1.60	12 × 19	14.00	16.00
14 × 21	18.75	16.00	2.25	14 × 21	17.50	19.75
16 × 23½	22.50	26.00	2.80	16 × 23½	28.00	31.50
18 × 25	27.50	31.00	2.80	18 × 25	33.00	36.50
20 × 27½	30.00	34.00	4.00	20 × 27½	36.00	40.00
				22 × 29½	41.00	46.00
				24 × 32	50.00	55.00

NOTE.—Flanges and Flanged Fittings are drilled in multiples of four, so that fittings may be made to face in any quarter, and holes straddle center line.



## REDUCING COMPANION FLANGES

WITH RIBS

FOR STANDARD

## FLANGED FITTINGS

FOR 125 POUNDS WORKING  
PRESSURE

Size. Inches	PRICE		Size	PRICE		Size	PRICE	
	Faced. Each.	Faced and Drilled. Each.		Faced Each.	Faced and Drilled. Each.		Faced. Each.	Faced and Drilled. Each.
2 × 7	2.10	3.00	5 × 11	4.75	6.00	10 × 21	20.00	24.00
2 × 7½	2.40	3.35	4½ × 12½	6.50	8.50	12 × 21	20.00	24.00
2½ × 7½	2.40	3.35	5 × 12½	6.50	8.50	10 × 23½	34.00	39.00
2 × 8½	2.70	3.75	6 × 12½	6.50	8.50	12 × 23½	34.00	39.00
2½ × 8½	2.70	3.75	5 × 13½	7.50	9.75	14 × 23½	34.00	39.00
3 × 8½	2.70	3.75	6 × 13½	7.50	9.75	12 × 25	41.00	46.00
2½ × 9	3.25	4.50	7 × 13½	7.50	9.75	14 × 25	41.00	46.00
3 × 9	3.25	4.50	6 × 15	10.00	12.25	16 × 25	41.00	46.00
3½ × 9	3.25	4.50	7 × 15	10.00	12.25	14 × 27½	45.00	51.00
3 × 9¼	3.75	5.00	8 × 15	10.00	12.25	16 × 27½	45.00	51.00
3½ × 9¼	3.75	5.00	7 × 16	11.50	14.00	18 × 27½	45.00	51.00
4 × 9¼	3.75	5.00	8 × 16	11.50	14.00	16 × 29½	50.00	58.50
3½ × 10	4.25	5.50	9 × 16	11.50	14.00	18 × 29½	50.00	58.50
4 × 10	4.25	5.50	8 × 19	15.75	18.75	20 × 29½	50.00	58.50
4½ × 10	4.25	5.50	9 × 19	15.75	18.75	18 × 32	61.00	70.00
4 × 11	4.75	6.00	10 × 19	15.75	18.75	20 × 32	61.00	70.00
4½ × 11	4.75	6.00	9 × 21	20.00	24.00			

### REDUCING FLANGED FITTINGS.

It is not possible to carry in stock a line of Reducing Flanged Fittings sufficiently large to meet all demands promptly. We aim to carry a complete line of straight sizes and a moderate line of Reducing Tees, but we do not attempt to cover all possible sizes.

To avoid delay, we carry in stock a line of Reducing Ribbed Flanges as illustrated above. These Flanges, used in connection with Straight or Reducing Fittings carried in stock enable us to fill orders for reduced sizes very promptly.

**CUSTOMERS WHO DESIRE FITTINGS REDUCED IN THIS MANNER WILL PLEASE SPECIFY "REDUCE BY FLANGES IF NECESSARY."**

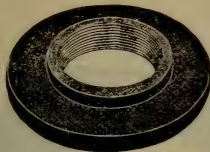
Reducing Flanges are carried in stock as per table above

These Flanges will always be the same thickness as the regular companion flanges of corresponding outside diameter.

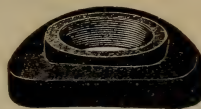


## CAST IRON FITTINGS.

FLANGE



CURVED FLANGE.



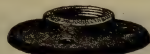
## FLANGES

Size Pipe, Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10	12
Diameter Inches																			
3	.10	.10																	
3 $\frac{1}{2}$	.15	.15	.15	.15	.16														
4	.22	.22	.22	.16	.16														
4 $\frac{1}{2}$	.25	.25	.25	.25	.25	.22													
5	.35	.35	.30	.30	.30	.30	.35												
5 $\frac{1}{2}$	.45	.45	.45	.40	.40	.40	.35	.40											
6	.50	.50	.50	.42	.40	.40	.42	.42	.50										
6 $\frac{1}{2}$		.65	.60	.60	.60	.55	.50	.50	.50	.65									
7		.75	.75	.75	.70	.70	.62	.62	.62	.75									
7 $\frac{1}{2}$		.90	.90	.90	.85	.85	.80	.80	.75	.85	.90								
8		1.00	1.00	1.00	.95	.95	.90	.90	.90	.90	.90								
8 $\frac{1}{2}$		1.25	1.25	1.25	1.15	1.15	1.10	1.10	1.10	1.00	1.00								
9				1.35	1.35	1.35	1.30	1.25	1.15	1.15	1.15	1.15	1.40						
9 $\frac{1}{2}$					1.90	1.90	1.75	1.75	1.60	1.60	1.50	1.25	1.50	1.50					
10					2.25	2.25	2.15	2.00	1.80	1.50	1.50	1.50	1.50	1.50	1.50				
11							2.50	2.50	2.25	2.25	2.00	1.75	1.75	1.75	2.20				
12								3.00	3.00	2.75	2.50	2.50	2.20	2.20	2.20	2.80			
13									3.50	3.50	3.25	3.00	3.00	2.80	2.80	2.80			
14									4.00	4.00	3.75	3.75	3.50	3.25	3.25	3.25	3.75	4.00	
15										4.00	4.00	4.00	4.00	4.50					
16														5.00	5.00	5.00	5.00	6.00	
17														6.50	6.50	5.75	5.75	7.00	
18															8.00	8.00	7.00	7.00	
19																	7.50	7.50	
20																			8.50

Curved Flanges (U-85) made to order at special prices.

In ordering Curved Flanges it is necessary to give the circle they are to fit.

## DRILLED FLOOR FLANGES.



Size Pipe, inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2
Diameter Flange, inches	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4	4	4 $\frac{1}{2}$	5 $\frac{1}{2}$
Each	.10	.15	.15	16	16	.22	.36

# MALLEABLE IRON FITTINGS.



Plain Elbow.



Beaded Elbow.



45° Elbow



Street Elbow



Side Outlet Elbow



Drop Elbow Female

Drop Elbow.  
Male and FemaleLong Drop Elbow.  
Male and Female.

Plain Tee



Beaded Tee.



Four Way Tee.



Drop Tee. Female.



Drop Tee. Male and Female.



V Branch.



Plain Cross.



Beaded Cross.

Return Bend.  
Close Pattern.Return Bend.  
Open Pattern.Right and Left  
Coupling.

Reducing Coupling.

## MALLEABLE IRON FITTINGS.

PIECE PRICE LIST.

BLACK.													
INCH	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Elbow, Right Hand.....	.04	.04	.06	.10	.15	.22	.25	.35	.50	.80	1.50	2.25	3.00
Elbow, Right and Left .....	.05	.07	.12	.17	.25	.30	.40	.65					
Elbow, 45° .....	.08	.10	.12	.18	.26	.36	.54	.82	1.25	2.50	3.25	4.50	
Elbow, Side Outlet.....		.08	.10	.18	.30	.45	.60	1.00					
Street Elbow.....	.10	.10	.12	.20	.25	.40	.55	.90	1.50				
Tee.....	.07	.07	.08	.11	.15	.25	.30	.45	.60	1.05	1.70	2.50	3.40
Tee, Four Way .....		.12	.14	.20	.35	.50	.80	1.25					
Cross.....	.08	.10	.12	.20	.30	.40	.60	1.00	1.75	3.00	3.25	5.25	
Drop Elbows.....	.06	.08	.12	.20	.25								
Drop Elbow, Long.....	.10												
Drop Tees.....	.10		.14	.22	.30								
Y Branch.....			.25	.40	.60	.80	1.00	1.70	2.00	3.00	3.50	4.00	
Return Bend, Close { R. H. ....			.13	.25	.35	.50	.75	1.00					
{ R. & L. ....			.15	.30	.45	.60	.90	1.25					
Return Bend, Open { R. H. ....			.15	.30	.50	.65	.85	1.25	2.00	3.00			
{ R. & L. ....			.20	.38	.60	.80	1.05	1.55	2.50	3.75			
Coupling, Right Hand.....	.03	.04	.07	.10	.14	.20	.25	.35					
Coupling, Right and Left.....	.04	.05	.08	.12	.16	.25	.36	.52					
Reducing Coupling.....	.03	.03	.05	.10	.16	.20	.28	.45	.70	1.00	1.50	1.85	
Cap.....	.03	.04	.05	.08	.12	.16	.24	.32	.45	.85	1.00	1.20	
Locknut.....	.02	.03	.04	.05	.07	.09	.11	.18					
Waste Nut.....	.04	.05	.06	.08	.10								
Extension Piece.....	.06	.09	.12										
Wall Plate.....	.12												
Chandelier Hooks.....	.10	.12											
Chandelier Loop.....	.10	.12											

## GALVANIZED.

INCH	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4
Elbow, Right Hand.....	.05	.08	.14	.20	.32	.40	.60	.90	1.35	2.60	3.75	5.00	
Elbow, 45° .....	.12	.15	.20	.25	.40	.50	.85	1.35					
Street Elbow.....	.12	.12	.15	.28	.35	.55	.80	1.30					
Tee.....	.09	.10	.16	.20	.38	.50	.70	1.00	1.90	3.00	4.25	5.75	
Cross.....		.17	.25	.45	.60	.90	1.50	2.75					
Drop Elbows.....	.12	.20	.35	.40									
Drop Elbow, Long.....	.18												
Drop Tees.....	.15	.25	.40	.55									
Y Branch.....	.38	.60	.90	1.25	1.50	2.50	3.00	4.50					
Return Bend, Close, R. H. ....	.25	.35	.55	.75	1.15	1.65							
Return Bend, Open, R. H. ....	.25	.45	.70	.90	1.25	2.00	3.50	5.00					
Coupling, Right Hand.....	.05	.07	.10	.17	.23	.30	.40	.55					
Coupling, Right and Left.....	.06	.08	.10	.17	.25	.35	.55	.75					
Reducing Coupling.....		.08	.15	.25	.35	.45	.75	1.05	1.65	2.40	3.05		
Cap.....	.04	.05	.08	.12	.17	.24	.38	.52	.76	1.30	1.60	2.00	
Locknut.....	.03	.04	.05	.07	.10	.14	.20	.30					
Waste Nut.....	.08	.10	.12	.16	.20								

## MALLEABLE IRON FITTINGS.

POUND PRICES.

## CLASSIFICATION AND PRICE LIST.

REVISED JUNE 10, 1895.

CLASS	A	B	C	D	E
Caps	$\frac{1}{8}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$ , $\frac{3}{4}$ and 1	$1\frac{1}{4}$ and larger	
Chandelier Hooks		All sizes			
Couplings, R. H.	$\frac{1}{8}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$ and $\frac{3}{4}$	1 and $1\frac{1}{4}$	$1\frac{1}{2}$ and larger
Couplings, R. & L.	$\frac{1}{8}$	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$ and $\frac{3}{4}$	1 and larger	
Couplings, Reducing $\frac{1}{4} \times \frac{3}{8}$ , $\frac{3}{8} \times \frac{1}{2}$		$\frac{3}{8} \times \frac{1}{4}$ to $\frac{3}{4} \times \frac{3}{8}$	$\frac{3}{4} \times \frac{1}{2}$ to $1 \times \frac{3}{4}$	$1\frac{1}{4}$ and larger†	
Crosses, Straight	$\frac{1}{8}$	$\frac{1}{4}$ , $\frac{3}{8}$ and $\frac{1}{2}$	$\frac{3}{4}$ and 1	$1\frac{1}{4}$ and larger	
Crosses, Reducing		1 and smaller		$1\frac{1}{4}$ and larger†	
Drop Ells		$\frac{1}{2}$ and smaller	$\frac{3}{4}$ and larger		
Drop Tees		$\frac{1}{2}$ and smaller	$\frac{3}{4}$ and larger		
Elbows	$\left\{ \begin{array}{l} \dots \frac{1}{8} \dots \frac{1}{4} \dots \frac{1}{2} \dots \frac{3}{4} \uparrow \dots 1\frac{1}{4} \text{ and larger}^* \\ \dots \frac{1}{4} \times \frac{1}{8} \dots \frac{3}{8} \dots \frac{1}{2} \times \frac{3}{8} \dots 1 \uparrow \\ \dots \frac{3}{8} \times \frac{1}{8} \dots \frac{3}{8} \times \frac{1}{4} \dots \frac{3}{4} \text{ Reducing} \dots 1 \times \frac{3}{4} \uparrow \\ \dots \frac{1}{2} \times \frac{1}{4} \end{array} \right.$				
Elbows 45°		$\frac{1}{2}$ and smaller	$\frac{3}{4}$ to 2	$2\frac{1}{2}$ and larger	
Elbows, Side Outlet		$\frac{1}{2}$ and smaller	$\frac{3}{4}$ and larger		
Elbows, R. & L.	$\frac{1}{4}$ and $\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$ and 1	$1\frac{1}{4}$ and larger†	
Extension Pieces		$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{3}{4}$ and larger		
Locknuts	$\frac{1}{8}$	$\frac{1}{4}$ , $\frac{3}{8}$ and $\frac{1}{2}$	$\frac{3}{4}$ , 1 and $1\frac{1}{4}$	$1\frac{1}{2}$ and larger	
Return Bends, R. H.		$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{3}{4}$ and 1	$1\frac{1}{4}$ and larger	
Return Bends, R. & L.	$\frac{3}{8}$ and $\frac{1}{2}$	$\frac{3}{4}$ and 1	$1\frac{1}{4}$ and larger		
Rod Couplings		All sizes			
Street Elbows	$\left\{ \begin{array}{l} \dots \frac{1}{8} \dots \frac{1}{4} \text{ and } \frac{3}{8} \dots \frac{1}{2}, \frac{3}{4} \times \frac{1}{2} \dots 1 \text{ and larger} \\ \dots \frac{3}{4}, 1 \times \frac{3}{4} \\ \dots \frac{1}{8} \dots \frac{1}{4} \text{ and } \frac{3}{8} \dots \frac{1}{2} \dots \frac{3}{4} \text{ and } 1 \uparrow \dots 1\frac{1}{4} \text{ and larger}^* \\ \dots \frac{3}{8} \times \frac{1}{4} \dots \frac{1}{4} \times \frac{3}{8}, \frac{3}{8} \times \frac{1}{4} \dots \frac{1}{2} \text{ Reducing} \dots 1 \times \frac{3}{4} \uparrow \\ \dots \frac{1}{4} \times \frac{1}{8} \dots \frac{3}{8} \times \frac{1}{4} \times \frac{1}{4} \dots \frac{3}{4} \text{ Reducing} \\ \dots \frac{3}{8} \times \frac{1}{8} \dots \frac{3}{8} \times \frac{1}{4} \times \frac{3}{8} \end{array} \right.$				
Tees					
Tees, Four Way		$\frac{1}{2}$ and smaller	$\frac{3}{4}$ and larger		
Wall Plates		All sizes			
Waste Nuts		$\frac{3}{4}$ and smaller	1 and larger		
Y Branches		$\frac{1}{2}$ and $\frac{3}{4}$	1 and larger		

† Such fittings in Class D as have one or more openings smaller than  $\frac{3}{4}$  will be classed as C.

\* Such fittings in Class E as have one or more openings smaller than 1 will be classed as D.

The run of a bull-head Tee gives the size for the purpose of classification, the large outlet not being considered.

## PRICE LIST.

CLASS	A	B	C	D	E
Black, per lb.	30	20	16	13	11
Galvanized, " "	40	27	23	20	18

An extra charge of 10 cents will be added to the list prices of Galvanized fittings not enumerated in standard list on page

IN ORDERING BE PARTICULAR TO STATE WHETHER FITTINGS ARE TO BE BEADED OR PLAIN.



## MALLEABLE IRON FITTINGS.

## REVISED CLASSIFICATION AND PRICE LIST

(Superseding all Previous Classifications.)

## MALLEABLE IRON. GAS. WATER AND STEAM FITTINGS.

Adopted by Manufacturers June 19th, 1895

## CLASS A.

Price, 30 cents per pound.

Elbows,  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ .  
 Tees,  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ .  
 R. & L. Couplings,  $\frac{1}{2}$ .  
 Reducers,  $\frac{1}{2}$  x  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ .

R. H. Couplings,  $\frac{1}{2}$ .  
 Ells, R. & L.,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 R. & L. Return Bends.

## CLASS B.

Price, 20 cents per pound.

Elbows,  $\frac{3}{4}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ ,  $\frac{1}{2}$  x  $\frac{1}{2}$ .  
 Tees,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$  x  $\frac{1}{2}$ ,  $\frac{3}{4}$  x  $\frac{1}{2}$ ,  $\frac{1}{2}$  x  $\frac{1}{2}$ .  
 Elbows, Side Outlets,  $\frac{1}{2}$  and smaller  
 Tees, Side Outlets,  $\frac{1}{2}$  and smaller  
 Street Ells,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 Crosses,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$ .  
 Reducing Crosses, 1 and smaller.  
 Drop Ells and Tees,  $\frac{1}{2}$  and smaller.  
 Caps,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 Lock Nuts,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$ .  
 Reducers,  $\frac{3}{4}$  x  $\frac{1}{2}$  to  $\frac{1}{2}$  x  $\frac{3}{4}$ , inclusive

Extension Pieces,  $\frac{3}{4}$  and  $\frac{1}{2}$ .  
 R. & L. Couplings,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 R. H. Couplings,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 R. & L. Elbows,  $\frac{1}{2}$ .  
 Waste Nuts,  $\frac{1}{2}$  and smaller.  
 Chandelier Hooks, all sizes.  
 Return Bends,  $\frac{3}{4}$  and  $\frac{1}{2}$ .  
 Return Bends, R. and L.,  $\frac{3}{4}$ , 1.  
 Wall Plates, all sizes.  
 45° Ells,  $\frac{1}{2}$  and smaller.  
 Y's,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .

## CLASS C.

Price, 16 cents per pound.

Elbows,  $\frac{1}{2}$  and  $\frac{1}{2}$  x  $\frac{3}{4}$ .  
 Elbows, R. & L.,  $\frac{3}{4}$ , 1.  
 Tees,  $\frac{1}{2}$  and  $\frac{1}{2}$  reducing.  
 Elbows, Side Outlets,  $\frac{3}{4}$  and larger  
 Tees, Side Outlets,  $\frac{3}{4}$  and larger.  
 Street Ells,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$  x  $\frac{1}{2}$ , 1 x  $\frac{1}{2}$  in  
 Crosses, 1 and  $\frac{1}{2}$  straight  
 Drop Ells,  $\frac{3}{4}$  and larger  
 Drop Tees,  $\frac{3}{4}$  and larger  
 Caps,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and 1

Lock Nuts,  $\frac{3}{4}$ , 1, 1 $\frac{1}{2}$ .  
 Reducers,  $\frac{3}{4}$  x  $\frac{1}{2}$  to 1 inclusive.  
 R. & L. Couplings,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 R. H. Couplings,  $\frac{1}{2}$ ,  $\frac{3}{4}$ .  
 Extension Pieces,  $\frac{3}{4}$  and larger  
 Waste Nuts, 1 and larger.  
 Return Bends,  $\frac{3}{4}$ , 1.  
 45° Ells,  $\frac{3}{4}$  to 2 inclusive.  
 Y's, 1 and larger.  
 Return Bends, R. & L. 1 $\frac{1}{2}$  and larger.

## CLASS D.

Price, 13 cents per pound.

Elbows and Tees,  $\frac{3}{4}$  and 1  
 Crosses, 1 $\frac{1}{2}$  and larger  
 Street Ells, 1 and larger.  
 Caps, 1 $\frac{1}{2}$  and larger.  
 Lock Nuts, 1 $\frac{1}{2}$  and larger  
 Reducers, 1 $\frac{1}{2}$  and larger.  
 Such Fittings as have smaller outlets than  $\frac{3}{4}$  will be classed "C."

R. H. Couplings, 1 and 1 $\frac{1}{2}$  in.  
 R. & L. Couplings, 1 and larger.  
 R. & L. Elbows, 1 $\frac{1}{2}$  and larger  
 45° Elbows, 2 $\frac{1}{2}$  and larger  
 Return Bends, 1 $\frac{1}{2}$  and larger.

## CLASS E.

Price, 11 cents per pound.

Elbows and Tees, 1 $\frac{1}{2}$  and larger, Right Hand Couplings, 1 $\frac{1}{2}$ , 2 Such Fittings  
 in this class that have outlets smaller than 1 to be classed "D."

The run of Tees, (Bullheads), gives the size for the purpose of classification, and the outlet being larger does not change it.

Return Bends, reduced. Return Bends, tapped on spread. Elbows, tapped on pitch, 15 per cent. added.

## PRICE LIST.

CLASS	A.	B.	C.	D.	E.
Price, per pound, Black	30 cents.	20 cents	16 cents.	13 cents.	11 cents
Price, per pound, Galvanized	40 cents	27 cents.	23 cents	20 cents.	18 cents

## LIST OF SIZES, ESTIMATED WEIGHTS, AND CLASSIFICATION

OF

## MALLEABLE IRON FITTINGS.

## ELBOWS.

Size	Approximate Weight per 100.	Class
$\frac{1}{8}$	5½ lbs	A
$\frac{1}{4}$ x $\frac{1}{8}$	9	A
$\frac{3}{8}$ x $\frac{1}{8}$	14¾	A
$\frac{1}{4}$	10	B
$\frac{3}{8}$ x $\frac{1}{4}$	16	B
$\frac{3}{8}$	17½	B
$\frac{1}{2}$ x $\frac{1}{4}$	23½	B
$\frac{1}{2}$ x $\frac{3}{8}$	22¾	C
$\frac{1}{2}$	26	C
$\frac{3}{4}$ x $\frac{3}{8}$	45	C
$\frac{3}{4}$ x $\frac{1}{2}$	38	C
$\frac{3}{4}$	41½	D
1 x $\frac{3}{8}$	52¾	C
1 x $\frac{1}{2}$	60	C
1 x $\frac{3}{4}$	60½	D
1	65¼	D
$1\frac{1}{4}$ x $\frac{3}{4}$	91	D
$1\frac{1}{4}$ x 1	98	E
$1\frac{1}{4}$	97	E
$1\frac{1}{2}$ x $\frac{3}{4}$	130	D
$1\frac{1}{2}$ x 1	106	E
$1\frac{1}{2}$ x $1\frac{1}{4}$	144	E
$1\frac{1}{2}$	128	E
2 x $\frac{1}{2}$	195	D
2 x $\frac{3}{4}$	196	D
2 x 1	188	E
2 x $1\frac{1}{4}$	196	E
2 x $1\frac{1}{2}$	178	E
2	214	E
$2\frac{1}{2}$ x $1\frac{1}{2}$	280	E
$2\frac{1}{2}$ x 2	380	E
$2\frac{1}{2}$	385	E
3 x $1\frac{1}{2}$	500	E
3 x 2	460	E
3 x $2\frac{1}{2}$	536	E
3	592	E
$3\frac{1}{2}$ x 3	806	E
$3\frac{1}{2}$	830	E
4 x 2	800	E
4 x 3	930	E
4 x $3\frac{1}{2}$	950	E
4	1250	E
$4\frac{1}{2}$	1750	E
5	2080	E
6	3250	E

## 45° ELBOWS.

Size	Approximate Weight per 100	Class
$\frac{1}{4}$		B
$\frac{3}{8}$		B
$\frac{1}{2}$	24½ lbs.	B
$\frac{3}{4}$	33½	C
1	54	C
$1\frac{1}{4}$	88	C
$1\frac{1}{2}$	119	C
2	175	C
$2\frac{1}{2}$	309	D
3	593	D
$3\frac{1}{2}$	726	D
4	900	D
$4\frac{1}{2}$		D
5		D
6		D

## STREET ELBOWS.

Size	Approximate Weight per 100	Class
$\frac{1}{4}$	13 lbs.	B
$\frac{3}{8}$	16¼	B
$\frac{1}{2}$	27¾	C
$\frac{3}{4}$ x $\frac{1}{2}$	45	C
$\frac{3}{4}$	49½	C
1 x $\frac{3}{4}$	62	C
1	65	D
$1\frac{1}{4}$ x 1	88	D
$1\frac{1}{4}$	102	D
$1\frac{1}{2}$ x $1\frac{1}{4}$	146	D
$1\frac{1}{2}$	159	D
2 x $1\frac{1}{2}$	225	D
2	252	D
$2\frac{1}{2}$		D
3		D

## SIDE OUTLET ELBOWS.

Size	Approximate Weight per 100	Class
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{1}{4}$	14 lbs.	B
$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{3}{8}$	16	B
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{8}$	23	B
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$	28	B
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{8}$	29	B
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	31	B
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$	32	C

## MALLEABLE IRON FITTINGS—CONTINUED.

## SIDE OUTLET ELBOWS—CONTINUED.

Size	Approximate Weight per 100	Class
1 x 1 x $\frac{3}{8}$	48 lbs.	C
1 x 1 x $\frac{1}{2}$	54	C
1 x 1 x $\frac{3}{4}$	50	C
1 x 1 x 1	58	C
$1\frac{1}{4}$ x $1\frac{1}{4}$ x 1	108	C
$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$	118	C
$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{2}$	151	C
2 x 3 x 2		C

## FOUR WAY TEES.

Size	Approximate Weight per 100	Class
$\frac{3}{8}$		B
$\frac{1}{2}$	28 lbs.	B
$\frac{3}{4}$	40	C
1	99	C
$1\frac{1}{4}$	130	C
$1\frac{1}{2}$	153	C
2		C

## TEES.

Size	Approximate Weight per 100	Class
$\frac{1}{8}$	9 lbs.	A
$\frac{3}{8}$ x $\frac{1}{4}$	$9\frac{1}{2}$	A
$\frac{1}{4}$ x $\frac{3}{8}$ x $\frac{1}{8}$	$10\frac{1}{2}$	A
$\frac{1}{4}$ x $\frac{1}{2}$	$9\frac{1}{4}$	A
$\frac{3}{8}$ x $\frac{1}{2}$	$12\frac{1}{4}$	A
$\frac{1}{4}$	12	B
$\frac{1}{4}$ x $\frac{3}{8}$	17	B
$\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{1}{4}$	$18\frac{1}{2}$	B
$\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{3}{8}$	18	B
$\frac{3}{8}$ x $\frac{1}{4}$	17	B
$\frac{3}{8}$	$18\frac{1}{2}$	B
$\frac{3}{8}$ x $\frac{1}{2}$	$23\frac{1}{4}$	C
$\frac{1}{2}$ x $\frac{1}{4}$ x $\frac{3}{8}$	$24\frac{1}{2}$	C
$\frac{1}{2}$ x $\frac{1}{4}$ x $\frac{1}{2}$	$28\frac{1}{2}$	C
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{8}$	$24\frac{1}{4}$	C
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{1}{2}$	23	C
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{4}$	27	C
$\frac{1}{2}$ x $\frac{3}{8}$ x $\frac{3}{4}$	40	C
$\frac{1}{2}$ x $\frac{3}{4}$	23	C
$\frac{1}{2}$ x $\frac{3}{4}$	$25\frac{1}{2}$	C
$\frac{1}{2}$	$20\frac{1}{2}$	C
$\frac{1}{2}$ x $\frac{3}{4}$	41	C
$\frac{1}{2}$ x 1	71	C
$\frac{1}{2}$ x $1\frac{1}{4}$	120	C
$\frac{3}{4}$ x $\frac{1}{4}$ x $\frac{3}{4}$	48	C

## TEES—CONTINUED.

Size	Approximate Weight per 100	Class
$\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{3}{8}$	45 lbs.	C
$\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{1}{2}$	43	C
$\frac{3}{4}$ x $\frac{3}{8}$ x $\frac{3}{4}$	48	C
$\frac{3}{4}$ x $\frac{3}{8}$ x 1	66	C
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{4}$	38	C
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{8}$	42	C
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{2}$	44	C
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$	$50\frac{1}{4}$	C
$\frac{3}{4}$ x $\frac{1}{2}$ x 1	65	C
$\frac{3}{4}$ x $\frac{1}{4}$	44	C
$\frac{3}{4}$ x $\frac{3}{8}$	41	C
$\frac{3}{4}$ x $\frac{1}{2}$	42	C
$\frac{3}{4}$	$50\frac{1}{2}$	D
$\frac{3}{4}$ x 1	63	D
1 x $1\frac{1}{4}$	114	D
1 x $\frac{3}{8}$ x $\frac{1}{2}$	54	C
1 x $\frac{3}{8}$ x $\frac{3}{4}$	63	C
1 x $\frac{3}{8}$ x 1	$78\frac{1}{2}$	C
1 x $\frac{3}{8}$ x $1\frac{1}{4}$	$98\frac{1}{2}$	C
1 x $\frac{1}{2}$ x $\frac{3}{8}$	56	C
1 x $\frac{1}{2}$ x $\frac{1}{2}$	63	C
1 x $\frac{1}{2}$ x $\frac{3}{4}$	$67\frac{1}{2}$	C
1 x $\frac{1}{2}$ x 1	73	C
1 x $\frac{1}{2}$ x $1\frac{1}{4}$	108	C
1 x $\frac{3}{4}$ x $\frac{3}{8}$	$58\frac{1}{2}$	C
1 x $\frac{3}{4}$ x $\frac{1}{2}$	60	C
1 x $\frac{3}{4}$ x $\frac{3}{4}$	$71\frac{1}{4}$	D
1 x $\frac{3}{4}$ x 1	72	D
1 x $\frac{3}{4}$ x $1\frac{1}{4}$	105	D
1 x $\frac{1}{2}$	$59\frac{1}{4}$	C
1 x $\frac{3}{8}$	62	C
1 x $\frac{1}{2}$	64	C
1 x $\frac{3}{4}$	71	D
1	75	D
1 x $\frac{1}{4}$	100	E
1 x $1\frac{1}{2}$	112	E
1 x 2	195	D
$1\frac{1}{4}$ x $\frac{3}{8}$ x 1	114	D
$1\frac{1}{4}$ x $\frac{3}{8}$ x $1\frac{1}{4}$	133	D
$1\frac{1}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$	104	D
$1\frac{1}{4}$ x $\frac{1}{2}$ x 1	108	D
$1\frac{1}{4}$ x $\frac{1}{2}$ x $1\frac{1}{4}$	$133\frac{1}{2}$	D
$1\frac{1}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	106	D
$1\frac{1}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$	100	D
$1\frac{1}{4}$ x $\frac{3}{4}$ x 1	116	D
$1\frac{1}{4}$ x $\frac{3}{4}$ x $1\frac{1}{4}$	132	D
$1\frac{1}{4}$ x 1 x $\frac{3}{8}$	81	D
$1\frac{1}{4}$ x 1 x $\frac{1}{2}$	92	D
$1\frac{1}{4}$ x 1 x $\frac{3}{4}$	100	D
$1\frac{1}{4}$ x 1 x 1	116	E
$1\frac{1}{4}$ x 1 x $1\frac{1}{4}$	$106\frac{1}{4}$	E

## MALLEABLE IRON FITTINGS—CONTINUED.

## TEES—CONTINUED

Size	Approximate Weight per 100	Class
1 1/4	145 lbs.	E
1 1/4	89	D
1 1/4	82	D
1 1/4	100 1/2	D
1 1/4	107	E
1 1/4	132	E
1 1/4	156	E
1 1/4	169	E
1 1/4	131	D
1 1/4	167	D
1 1/4	164	D
1 1/4	115	D
1 1/4	140	D
1 1/4	155	D
1 1/4	110	D
1 1/4	125	E
1 1/4	151	E
1 1/4	154 1/2	E
1 1/4	113 1/2	D
1 1/4	112 1/2	D
1 1/4	127 1/2	E
1 1/4	144	E
1 1/4	160	E
1 1/4	104	D
1 1/4	112	D
1 1/4	116	D
1 1/4	128	E
1 1/4	156	E
1 1/4	160	E
1 1/4	198	E
1 1/4	180	E
2	236	D
2	226	D
2	240	D
2	224	E
2	201 1/2	E
2	231	E
2	236	E
2	222	D
2	224	E
2	209 1/2	E
2	224	E
2	244	E
2	154	D
2	160	D
2	161	D
2	181	E
2	203	E
2	220	E
2	268 1/2	E
2	320 1/2	E
2 1/2	315	E
2 1/2	295	E
2 1/2	300	E
2 1/2	348	E
2 1/2	470	E
2 1/2	538	E
2 1/2	525	E
3	530	E
3	532	E
3	610	E
3	632	E
3	745	E
3 1/2		E
3 1/2	770	E

## TEES—CONTINUED.

Size	Approximate Weight per 100	Class
3 1/2	950 lbs.	E
3 1/2	1003	E
4	1110	F
4	1182 1/2	E
4	1245	E
4	1513	E
4	1465	E
4 1/2		E
5	2690	E
6	4600	E

## CROSSES.

Size	Approximate Weight per 100	Class
1 1/4	153 1/2 lbs.	B
1 1/4	173 1/4	B
1 1/4	23	B
1 1/4	24	B
1 1/4	24	B
1 1/4	27	B
1 1/4	28 1/2	B
1 1/4	27	B
1 1/4	28	B
1 1/4	31	B
1 1/4	39	B
1 1/4	39	B
1 1/4	50	B
1 1/4	44 1/2	B
1 1/4	50 1/4	B
1 1/4	50	B
1 1/4	52	B
1 1/4	52	C
1 1/4	53	B
1 1/4	62	B
1 1/4	64	B
1 1/4	68 1/2	B
1 1/4	69	B
1 1/4	72	B
1 1/4	92	C
1 1/4	96	D
1 1/4	105	D
1 1/4	90	C
1 1/4	106	C
1 1/4	118	D
1 1/4	132	D
1 1/4	158	D
1 1/4	158	D
1 1/4	119	C
1 1/4	114 1/2	C
1 1/4	132	D
1 1/4	146	D
1 1/4	185	D
1 1/4	198	D
1 1/4	157	C
1 1/4	180	C
1 1/4	194	D
1 1/4	226	D
1 1/4	252	D
1 1/4	262	D
1 1/4	288	D
1 1/4	318	D
1 1/4	340	D
1 1/4	380	D
1 1/4	600	D



## MALLEABLE IRON FITTINGS—CONTINUED.

## REDUCING COUPLINGS—CONTINUED.

Size	Approximate Weight per 100	Class
$\frac{3}{8}$ x $1\frac{1}{4}$	98 lbs.	D
$\frac{3}{8}$ x $1\frac{1}{2}$	105 $\frac{1}{4}$	D
$2\frac{1}{2}$ x $\frac{3}{4}$		D
$2\frac{1}{2}$ x 1	185	D
$2\frac{1}{2}$ x $1\frac{1}{4}$	174 $\frac{1}{2}$	D
$2\frac{1}{2}$ x $1\frac{1}{2}$	177	D
$2\frac{1}{2}$ x 2	189	D
3 x 1	256	D
3 x $1\frac{1}{4}$	280	D
3 x $1\frac{1}{2}$	250	D
3 x 2	265	D
3 x $2\frac{1}{2}$	300	D
$3\frac{1}{2}$ x $1\frac{1}{2}$		D
$3\frac{1}{2}$ x 2		D
$3\frac{1}{2}$ x $2\frac{1}{2}$	362	D
$3\frac{1}{2}$ x 3	370	D
4 x 1		D
4 x 2	430	D
4 x $2\frac{1}{2}$	505	D
4 x 3	480	D
4 x $3\frac{1}{2}$	495	D

## EXTENSION PIECES.

$\frac{3}{8}$ x $\frac{3}{8}$	10 lbs.	B
$\frac{1}{2}$ x $\frac{3}{8}$	19 $\frac{1}{2}$	B
$\frac{3}{4}$ x $\frac{3}{4}$	28	C
1 x 1	41 $\frac{1}{2}$	C
1 x $\frac{3}{4}$	39	C
$1\frac{1}{4}$ x $\frac{3}{4}$	48	C

## RIGHT AND LEFT COUPLINGS.

Size	Approximate Weight per 100	Class
$\frac{1}{8}$		A
$\frac{1}{4}$	7 $\frac{1}{4}$ lbs.	B
$\frac{3}{8}$	13	B
$\frac{1}{2}$	20 $\frac{1}{2}$	C
$\frac{3}{4}$	29 $\frac{3}{4}$	C
1	53 $\frac{1}{4}$	D
$1\frac{1}{4}$	80 $\frac{1}{2}$	D
$1\frac{1}{2}$	115	D
2	170	D

## RIGHT HAND COUPLINGS.

$\frac{1}{8}$	4 $\frac{1}{2}$ lbs.	A
$\frac{1}{4}$	6 $\frac{1}{4}$	B
$\frac{3}{8}$	10 $\frac{1}{2}$	B
$\frac{1}{2}$	18	C
$\frac{3}{4}$	27 $\frac{1}{4}$	C
1	47 $\frac{1}{2}$	D
$1\frac{1}{4}$	70	D
$1\frac{1}{2}$	97	E
2	148	E

## LOCKNUTS.

$\frac{1}{4}$	3 $\frac{1}{2}$ lbs.	B
$\frac{3}{8}$	5 $\frac{3}{4}$	B
$\frac{1}{2}$	7 $\frac{1}{4}$	B
$\frac{3}{4}$	12 $\frac{3}{4}$	C
1	17 $\frac{1}{4}$	C
$1\frac{1}{4}$	26 $\frac{1}{4}$	C
$1\frac{1}{2}$	34	D
2	50	D

## LOCKNUTS—CONTINUED.

Size	Approximate Weight per 100	Class
$2\frac{1}{2}$	185 lbs.	D
3	195	D
$3\frac{1}{2}$	270	D
4	475	D

## WASTE NUTS.

$\frac{1}{4}$	5 lbs.	B
$\frac{3}{8}$	7	B
$\frac{1}{2}$	10	B
$\frac{3}{4}$	10 $\frac{1}{4}$	B
1	14 $\frac{1}{2}$	C

## WALL PLATES.

$\frac{3}{8}$	14 lbs.	B
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## CHANDELIER LOOPS.

$\frac{3}{8}$	15 $\frac{1}{2}$ lbs.	B
$1\frac{1}{2}$	29	B

## CHANDELIER HOOKS.

	MALE.	
$\frac{3}{8}$	18 $\frac{1}{4}$ lbs.	B
$1\frac{1}{2}$	27 $\frac{1}{4}$	B

## CHANDELIER HOOKS.

	FEMALE.	
$\frac{3}{8}$	20 lbs.	B
$1\frac{1}{2}$	21 $\frac{1}{2}$	B

## RETURN BENDS.

	OPEN PATTERN.	
$\frac{3}{8}$	21 $\frac{1}{2}$ lbs.	B
$\frac{1}{2}$	41 $\frac{1}{2}$	B
$\frac{3}{4}$	81 $\frac{3}{4}$	C
1	133	C
$1\frac{1}{4}$	191 $\frac{1}{4}$	D
$1\frac{1}{2}$	314 $\frac{1}{2}$	D
2	557	D
$2\frac{1}{2}$	750	D
3	1085	D
$3\frac{1}{2}$		D
4		D

## RETURN BENDS.

	CLOSE PATTERN.	
$\frac{3}{8}$	20 lbs.	B
$\frac{1}{2}$	35	B
$\frac{3}{4}$	67	C
1	100	C
$1\frac{1}{4}$	164	D
$1\frac{1}{2}$	245	D
2	395	D
$2\frac{1}{2}$	625	D
3	850	D
	V'S	

$\frac{1}{2}$		B
$\frac{3}{4}$		B
1	113 lbs.	C
$1\frac{1}{4}$	187	C
$1\frac{1}{2}$	275	C
2	437	C
$2\frac{1}{2}$		C
3	1000	C
$3\frac{1}{2}$		C
4		C

**STANDARD LIST**  
OF  
**GALVANIZED MALLEABLE IRON FITTINGS.**

**ELBOWS.**

$\frac{3}{8}$	1	x	$\frac{3}{4}$	2	.
$\frac{1}{2}$	$1\frac{1}{4}$			2	x $1\frac{1}{2}$
$\frac{1}{2}$ x $\frac{3}{8}$	$1\frac{1}{4}$ x 1			$2\frac{1}{2}$	
$\frac{3}{4}$	$1\frac{1}{2}$			3	
$\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{4}$			$3\frac{1}{2}$	
1				4	

**FEMALE  
DROP ELBOWS  
AND TEES.****STREET ELBOWS.****45° ELBOWS.**

$\frac{3}{8}$	$1\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$1\frac{1}{4}$
$\frac{1}{2}$	$1\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$1\frac{1}{2}$
$\frac{3}{4}$	2		1	2
1				

**TEES.**

$\frac{3}{8}$ x $\frac{3}{8}$ x $\frac{3}{8}$	1	x	1	x	$1\frac{1}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{2}$
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{8}$	$1\frac{1}{4}$	x	1	x	1	$1\frac{1}{2}$ x $1\frac{1}{2}$ x 2
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x		x	$1\frac{1}{4}$		2 x $1\frac{1}{2}$ x $1\frac{1}{2}$
$\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{4}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{3}{4}$					2 x 2 x $\frac{1}{2}$
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x 1					2 x 2 x $\frac{3}{4}$
$\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$					2 x 2 x 1
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{8}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$					2 x 2 x $1\frac{1}{4}$
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{1}{2}$	$1\frac{1}{4}$ x $1\frac{1}{4}$ x $\frac{1}{2}$					2 x 2 x $1\frac{1}{2}$
$\frac{3}{4}$ x $\frac{3}{4}$ x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{4}$					2 x $1\frac{1}{2}$ x 2
$\frac{3}{4}$ x $\frac{3}{4}$ x 1	$1\frac{1}{2}$ x $1\frac{1}{4}$ x $1\frac{1}{2}$					2 x 2 x 2
1 x $\frac{3}{4}$ x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{1}{2}$					$2\frac{1}{2}$ x $2\frac{1}{2}$ x $2\frac{1}{2}$
1 x $\frac{3}{4}$ x 1	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $\frac{3}{4}$					3 x 3 x 3
1 x 1 x $\frac{1}{2}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x 1					$3\frac{1}{2}$ x $3\frac{1}{2}$ x $3\frac{1}{2}$
1 x 1 x $\frac{3}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$ x $1\frac{1}{4}$					4 x 4 x 4
1 x 1 x 1						

**RIGHT HAND  
COUPLINGS.****RIGHT  
AND LEFT  
COUPLINGS.****REDUCING  
COUPLINGS.****CROSSES.****LOCKNUTS**

$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{4}$ x $\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{8}$
$\frac{3}{8}$	$\frac{1}{2}$	1 x $\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$
$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$ x 1	1	$\frac{3}{4}$
$\frac{3}{4}$	1	$1\frac{1}{2}$ x $1\frac{1}{4}$	$1\frac{1}{4}$	1
1	$1\frac{1}{4}$	$1\frac{1}{2}$ x $1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$
$1\frac{1}{4}$	$1\frac{1}{2}$	2 x $1\frac{1}{2}$	2	$1\frac{1}{2}$
$1\frac{1}{2}$	2			2
2				

## MALLEABLE IRON RAILING FITTINGS.

For Fences, Enclosing Engines and Machinery, Exhibition Spaces, etc.

Fig. 75.



Fig. 76.



Fig. 77.



Fig. 78.



Fig. 79.



Fig. 80.



Fig. 81.



Fig. 82.



Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Elbow	Each	.15	.18	.20	.35	.45	.72
Elbow, Side Outlet	"	.20	.23	.25	.40	.50	.80
Tee	"	.20	.23	.25	.40	.50	.75
Tee, Side Outlet	"	.30	.33	.35	.45	.55	.90
Cross	"	.30	.33	.35	.45	.58	1.00
Cross, Side Outlet	"	.35	.38	.40	.50	.65	1.35
Acorn	"	.16	.18	.20	.25	.35	.90
Hinge	"	.35	.40	.45	.55	.80	1.00
Flange	"	.14	.15	.15	.20	.28	.30

Railing Fittings will be furnished with all **RIGHT HAND** Threads unless otherwise specified.

Extra charge will be made for Right and Left or Left Hand Fittings.

As the Fittings do not need to be steam or water tight, a satisfactory job can be made by running Left Hand Tap into any Right Hand Outlet.

## POLISHED BRASS RAILING FITTINGS.

Size	Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Elbow	Each	.40	.60	.80	1.20	1.60	2.20
Elbow, Side Outlet	"	.75	1.00	1.45	1.65	2.05	2.90
Tee	"	.60	.85	1.10	1.70	2.00	2.75
Tee, Side Outlet	"	1.05	1.25	1.50	2.00	2.30	3.25
Cross	"	1.05	1.25	1.50	2.00	2.40	3.25
Cross, Side Outlet	"	1.20	1.45	1.70	2.12	2.60	3.50
Acorn	"	.40	.65	.80	.90	1.20	2.50
Hinge	"	.90	1.30	1.50	1.90	2.25	3.25
Flange	"	.26	.35	.40	.70	.95	1.30

## MALLEABLE IRON PIPE CLAMPS.

2, 2½ AND 3 INCH SIZES.



FOR  
WROUGHT IRON  
WATER PIPE.

4 TO 8 INCH SIZES.



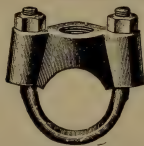
Size of Pipe, inches.....	2	2½	3	3	4	4	4	5	5
Tapped for Pipe, inches.	½ to 1	1 to 1¼	¾ to 1	1¼ to 2	¾ to 1½	2	3	¾ to 1½	2
U-80 AND 61, each.....	1.00	1.25	1.25	1.50	1.75	2.00	4.00	1.80	2.15
Size of Pipe, inches.....	5	6	6	6	7	7	7	8	8
Tapped for Pipe, inches.	3	¾ to 1½	2	3	¾ to 1½	2	3	2 to 3	4
each.....	4.00	2.25	2.50	5.00	2.50	2.70	5.00	5.50	6.00

The 4 inch size is also suitable for 3 inch Cast Iron Water Pipe.

" 5	"	"	4	"	"
" 6	"	"	5	"	"
" 7	"	"	6	"	"

## CAST IRON WATER PIPE CLAMP.

FOR CAST IRON WATER PIPE.



Size of Pipe, inches.....	2	3	3	4	4	5
Tapped for Pipe, inches.	½ to 1	¾ to 1	1¼ to 2	¾ to 1¼	1½ to 2	¾ to 1¼
Each.....	.50	.65	.80	.90	1.00	1.00
Size of Pipe, inches.....	5	6	6	7	7	8
Tapped for Pipe, inches.	1½ to 2	¾ to 1¼	1½ to 2	¾ to 1¼	1½ to 2	2 to 3
Each.....	1.10	1.15	1.25	1.25	1.50	3.00

## MALLEABLE IRON PIPE SADDLE.

FOR STEAM PIPE.



Size of Pipe, inches.....	2	2½	3	4	5	6	6	8
Tapped for Pipe, inches.	1 to 1½	1 to 1½	1 to 2	1 to 2	1 to 2	1 to 2	2½ to 4	2½ to 4
Each.....	1.00	1.25	1.25	1.50	2.75	2.75	5.75	6.50



### CAST IRON HOOK PLATES.



### Hook Plates.

No. of Hooks.....	1	2	3	4	5	6
For 1 in. pipe, 2½ in. bet. centers. price,	.0	.18	.23	.26	.32	.38
" 1¼ " 3 " " "	.10	.21	.27	.32	.41	.52
" 1½ " 3½ " " "	.15	.28	.43	.58	.72	.88
" 2 " 4½ " " "	.22	.43	.65	.90	1.15	1.35



### Hook Plates.

No. of Hooks.....	1	2	3	4	5	6
For 1 in. pipe 2½ in. bet. centers, price, .15	.25	.35	.50	.60	.70	
" 1½ " 3 " " " " .17	.27	.40	.80	.70	.80	
" 1½ " 3½ " " " " .25	.40	.80	.75	.90	1.00	



-Beam Hooks, Long Shank

Size, inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, each	.13	15	.18	.22	.24	.35	.65	.90

Ceiling Plates, in One Piece.



Inch.	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Each.	.11	.13	.16	.18	.23	.27
Inch.	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Each.	.36	.50	.55	.68	.95	1.25

Ceiling Plate:

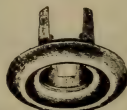


Cast Iron Floor Plate.

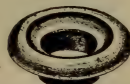


Inch. ....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
Each, Ceiling.	.22	.28	.32	.40	.50	.65	.90	1.00	1.20			
Each, Floor.	.06	.06	.08	.11	.14	.16	.24	.30	.35	.42	.60	.75

Spun Brass Floor and Ceiling Plates.



### Celling Plate



Floor Plate.

Size, inches .....	3/4	1	1 1/4	1 1/2	2
Price floor plates, nickel plated, each.	.10	.11	.12	.13	.15
Price ceiling plates, " " "	.10	.11	.12	.13	.15

## GAS PIPE HOOKS, WROUGHT

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price Per Thousand.....	\$ .25	.625	1.15	4.10	11.70	14.80	18.20	23.40
"    Hundred.....	.60	.65	.75	1.00	1.25	1.50	2.00	2.50
"    Each.....	.01	.01	.01	0.01	0.01	0.02	0.02 $\frac{1}{2}$	0.03



## EXPANSION PIPE HANGER.



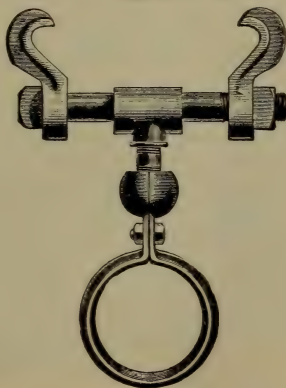
	Inch	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8
Each.....		.17	.18	.19	.25	.29	.36	.44	.55	.63	.90	1.12	1.35	1.80	2.25
Tapped for Nipples, inches		$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

## BALL JOINT PIPE HANGERS.

No. 1.



No. 2.



No. 3.



	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	3	$3\frac{1}{2}$	4	5	6	8	10	12
No. 1. Each		.15	.18	.18	.20	.22	.25	.30	.35	.37	.45	.58	.70	1.05	1.20	1.90
No. 2. Each		.55	.58	.58	.60	.62	.65	.70	.75	.77	.85	.98	1.10	1.45	1.60	2.30
No. 3. Each		.30	.33	.33	.35	.37	.40	.55	.62	.70	.83	1.05	1.20	1.55	1.70	2.30

When ordering No. 2 Hangers, state size of Beam.

## PIPE CUT TO ORDER.

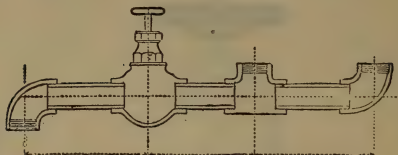


DIAGRAM SHOWING SCREWED VALVE AND FITTINGS.

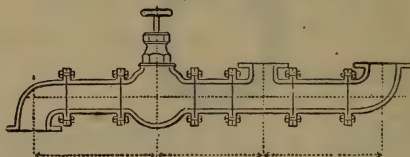


DIAGRAM SHOWING FLANGED VALVE AND FITTINGS

We are equipped with the most improved facilities for cutting, threading, and fitting all sizes of pipe to sketch.

In laying out work of this kind great care should be taken in making sketches. All measurements should be given centre to centre as shown in above diagrams. It is also necessary to know for what purpose the pipe is to be used and pressure required to stand.

## LAP WELDED TUYERE PIPE

FOR COILING PURPOSES.

Nominal Inside Diameter, Inches	Actual Outside Diameter Inches	Thickness, Inches	Nominal Weight per Foot, Pounds	Net Price per Ft. for Lengths 30 Feet and Under	Net Price per Ft. for Lengths 30 to 36 Feet
1	1.315	$\frac{1}{8}$	2.21	on application	
$1\frac{1}{4}$	1.66	$\frac{3}{8}$	3.13	"	"

## STEAM GAUGE SYPHONS.

BRASS AND IRON.



Size Pipe Thread .....	.....Inch	$\frac{1}{4}$
Iron .....	Each	.50
Brass, Finished .....	"	1.80
Brass, Nickelplated .....	"	2.00



## SEAMLESS DRAWN BRASS AND COPPER TUBES.



WILL THREAD TO FIT IRON PIPE FITTINGS.

Iron Pipe Size.	Inside Diameter.	Outside Diameter.	Length Feet, about	Approximate Weight Per Foot. Brass.	Copper
$\frac{1}{8}$	.27	$\frac{1}{4}$	12	.30	.31
$\frac{1}{4}$	.36	$\frac{1}{2}$	12	.43	.45
$\frac{3}{8}$	.49	$\frac{3}{4}$	12	.58	.61
$\frac{1}{2}$	.62	$\frac{1}{2}$	12	.80	.84
$\frac{3}{4}$	.82	$1\frac{1}{4}$	12	1.17	1.23
1	1.04	$1\frac{1}{2}$	12	1.67	1.75
$1\frac{1}{4}$	1.38	$1\frac{3}{4}$	12	2.42	2.54
$1\frac{1}{2}$	1.61	$1\frac{7}{8}$	12	2.92	3.07
2	2.06	$2\frac{1}{8}$	12	4.17	4.38
$2\frac{1}{2}$	2.46	$2\frac{3}{8}$	12	5.00	5.25
3	3.06	$3\frac{1}{8}$	12	8.00	8.40
$3\frac{1}{2}$	3.50	4	12	10.00	10.50
4	4.02	$4\frac{1}{2}$	12	12.00	12.00
5	5.04	5.56	8 to 10	15.93	17.30
6	6.06	6.62	6 to 8	20.69	22.38
7	7.02	7.62	Special	26.28	27.77
8	7.98	8.62	Special	29.88	33.69

Adopted February 6, 1899

Price List in Cents per Pound.

OUTSIDE DIAMETER.

Stubs' Gauge.	B. & S. Gauge.	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{3}{4}$	$\frac{13}{16}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8
4 to 11	3 to 9																										
12	10																										
13	11																										
14	12																										
15	13																										
16	14																										
17	15																										
18	16	81	61	46	42	39	36	35	34	32	31	30	28	27	27	27	27	28	29	30	31	32	33	34	35	36	38
19	17	86	62	47	43	40	37	35	34	33	32	30	29	28	28	28	29	30	31	32	33	34	35	36	37	38	38
20	18-19	91	64	49	44	41	39	38	37	36	35	34	32	31	30	30	30	31	32	33	34	35	36	37	38	39	40
21	20	96	66	51	46	43	41	40	39	38	37	36	35	34	32	32	32	33	34	35	36	37	38	39	40	41	42
22	21	101	71	56	48	44	42	41	40	39	38	37	36	34	34	34	35	36	37	38	39	40	41	42	43		
23	22	106	76	61	50	46	44	43	42	41	40	39	38	37	37	38	38	39	40	41	42	43	44				
24	23	116	81	66	53	48	46	45	44	43	41	40	40	41	41	42	42										
25	24	131	86	71	56	51	49	47	46	45	44	43	44	45													

NOTE.—For diameters of the fractional parts of an inch where no price is given, take the column to the left of where such size would appear if designated. Thus:  $1\frac{1}{4}$  would go at price of  $1\frac{3}{4}$  inches;  $1\frac{1}{2}$  at the price of 1 inch,  $5\frac{1}{8}$  inch at the price of 5 inches. No. 20 O. G. 1 inch is 34 cents; No. 20 O. G.  $1\frac{1}{4}$  inch is 32 cents; No. 20 O. G.  $1\frac{1}{2}$  inch would be 34 cents and not 32 cents.

Copper, Bronze and Gilding Tube 3 Cents per Pound Finished.



Rough Heavy  
Gov. Pat. Union,  
Ground Joint.

## LUNKENHEIMER BRASS UNIONS.

ROUGH HEAVY  
OR FINISHED PATTERNS.



Finished Union,  
Ground Joint.

Size .....	Inches	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough Heavy Government Pattern, Each		.35	.40	.55	.75	1.00	1.40	1.90	2.75	4.00	8.50
Finished Pattern .....	Each	.32	.36	.50	.70	.90	1.25	1.70	2.50	3.60	7.75



## BRASS SWING JOINTS.

Size .....	Inches	$\frac{1}{2} \times \frac{1}{2}$	$\frac{3}{4} \times \frac{3}{4}$	1x1	$1\frac{1}{4} \times 1\frac{1}{4}$	$1\frac{1}{2} \times 1\frac{1}{2}$	2x2
Rough Brass .....	Each	2.50	3.50	5.00	6.50	9.00	13.00
Finished Brass .....	Each	3.00	4.00	5.75	7.25	10.00	15.00

## LUNKENHEIMER BRASS FITTINGS.

FOR 175 LBS. WORKING PRESSURE.      ROUGH OR FINISHED.



Elbow.



Tee.



Cross.



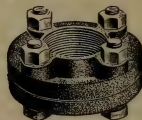
Coupling.



Return Bend,  
Close Pattern.



Return Bend,  
Open Pattern.



Flange Union.



Close Nipple.



Long Nipple.



Cap.



Plug.



Bushing.



Lock Nut.

## BRASS FITTINGS—(IRON PIPE THREAD).

The brass fittings and flanges listed herewith are of heavy and substantial design and must not be confounded with what are known to the trade as "standard fittings." They are made of gun metal, carefully threaded and guaranteed for 175 lbs. working pressure. Extra heavy fittings for 350 lbs. working pressure made to order.

## ROUGH.

Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, Each	.12	.17	.21	.28	.35	.50	.85	1.10	1.50	3.50	4.50	7.00	10.00	
Elbows, Reducing	.22	.26	.35	.45	.62	1.10	1.40	1.90	4.40	5.65	8.75	12.50		
Elbows, 45°	.20	.25	.35	.50	.75	1.15	1.50	2.25	4.25	7.00	9.00	10.00		
Elbows, Side Outlet	.25	.40	.45	.75	1.50	1.80								
Elbows, Street	.55	.75	1.00	1.80	2.25	3.50								
Tees	.15	.20	.30	.40	.50	.75	1.00	1.30	1.75	4.00	5.50	9.00	13.00	
Tees, Reducing	.25	.38	.50	.63	.95	1.25	1.65	2.20	5.00	6.90	11.25	16.25		
Tees, Side Outlet	.45	.60	1.25	1.70	2.00									
Crosses	.30	.40	.50	.60	.80	1.50	2.00	3.50	5.00	7.00	10.00	14.50		
Crosses, Reducing	.38	.50	.65	.75	1.00	1.90	2.50	4.40	6.25	8.75	12.50	18.00		
Drop Elbows, Female	.25	.30	.40	.55	.85									
Drop Tees, Female	.35	.45	.85	1.25										
Caps	.15	.15	.20	.25	.35	.45	.60	.80	1.10	2.00	3.00			
Plugs	.09	.10	.12	.15	.20	.28	.40	.50	.90	1.25	2.00	3.00	4.00	
Reducers, reducing one size	.16	.22	.42	.45	.65	.90	1.12	1.85	3.00	4.50				
Couplings	.10	.14	.16	.25	.37	.50	.60	.90	1.35	2.40	3.50			
Couplings, R. and L.	.17	.20	.30	.45	.60	.75	1.12	1.75						
Lock Nuts	.10	.12	.15	.20	.30	.45	.70	.95	1.50	2.75				
Nipples, Close	.12	.15	.20	.25	.30	.40	.60	.90	1.25	2.50	3.50			
Nipples, S. and L. to 4" Long	.15	.20	.30	.35	.45	.60	.90	1.25	1.60	3.00	4.50			
Bushings, reducing one size	.10	.12	.14	.21	.38	.50	.67	1.00	1.50	2.50				
Bushings, reducing two sizes	.10	.12	.14	.21	.38	.50	.67	1.00	1.50	2.50				
Return Bends, Open Pattern	.40	.50	1.00	1.35	2.00	3.00	4.50							
Return Bends, Close Pattern	.35	.40	.75	1.15	1.65	2.50	4.00							

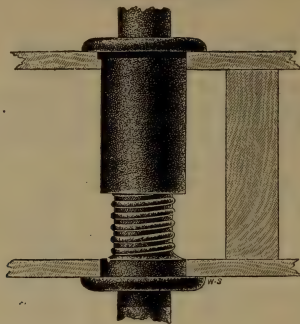
## FINISHED.

Size	Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, Each	.24	.34	.42	.56	.70	1.00	1.70	2.20	3.00	7.00	9.00	14.00	20.00	
Elbows, Reducing	.44	.52	.70	.90	1.25	2.20	2.80	3.80	8.80	11.30	17.50	25.00		
Elbows, 45°	.40	.50	.70	1.00	1.50	2.30	3.00	4.50	8.50	14.00	18.00	20.00		
Elbows, Side Outlet	.50	.80	.90	1.50	3.00	3.60								
Elbows, Street	.60	.70	.83	1.10	1.50	2.65	4.50	7.00						
Tees	.30	.40	.60	.80	1.00	1.50	2.00	2.60	3.50	8.00	11.00	18.00	26.00	
Tees, Reducing	.50	.76	1.00	1.25	1.90	2.50	3.30	4.40	10.00	13.80	22.50	32.50		
Tees, Side Outlet	.90	1.20	2.50	3.40	4.00									
Crosses	.60	.80	1.00	1.20	1.60	3.00	4.00	7.00	10.00	14.00	20.00	29.00		
Crosses, Reducing	.75	1.00	1.30	1.50	2.00	3.80	5.00	8.80	12.50	17.50	25.00	36.00		
Drop Elbows, Female	.50	.60	.80	1.10	1.70									
Drop Tees, Female	.70	.90	1.70	2.50										
Caps	.30	.30	.40	.50	.70	.90	1.20	1.60	2.20	4.00	6.00			
Plugs	.18	.20	.24	.30	.40	.56	.80	1.00	1.80	2.50	4.00	6.00	8.00	
Reducers, reducing one size	.32	.44	.64	.90	1.30	1.80	2.25	3.70	6.00	9.00				
Couplings	.20	.28	.32	.50	.75	1.00	1.20	1.80	2.70	4.80	7.00			
Couplings, R. and L.	.31	.36	.55	.82	1.10	1.35	2.00	3.10						
Lock Nuts	.20	.24	.30	.40	.60	.90	1.40	1.90	3.00	5.50				
Bushings	.20	.24	.28	.42	.76	1.00	1.35	2.00	3.00	5.00				
Return Bends, Open Pattern	.80	1.00	2.00	2.70	4.00	6.00	9.00							
Return Bends, Close Pattern	.70	.80	1.50	2.30	3.30	5.00	8.00							

## BRASS FLANGE UNIONS—ROUGH.

Size	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Complete with Bolts	3.50	3.50	3.75	4.25	5.60	6.50	8.50	10.50	13.50	15.00	20.00	22.00	27.00	

## FLOOR THIMBLE.



	Inch	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
No. 1. ....	Each	.50	.60	.80	1.00	1.20	1.40	1.65					
No. 1. Nickel Plated, .....	"	.90	1.00	1.30	1.60	1.90	2.20	2.75					
No. 2. ....	"	.60	.70	.90	1.10	1.30	1.55	1.80	2.15	3.00	4.50	5.00	6.50
No. 2. Nickel Plated, .....	"	1.00	1.10	1.40	1.70	2.00	2.35	2.90	3.35	4.40	6.00	6.60	8.30

No. 1. Minimum length, 9 inches; maximum length, 16 inches.

No. 2. " " 15 " " 22 "

No. 1 will always be shipped unless otherwise ordered.

## SEAMLESS DRAWN BRASS PIPE.



## IRON PIPE SIZE.

	IRON PIPE SIZE.										
	Inch	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{2}$	$2\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Approximate weight per foot, pounds .	.25	.43	.62	.90	1.25	1.70	2.50	3	4	5.75	8.30

## PRICES NET.

## PLUMBERS' TUBING.

	Inch	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$
Approximate weight per foot, pounds..		.44	.54	.66	.80	1.25	1.50	1.75

## PRICES NET.

Brass Pipe is usually carried in 12 foot lengths. Special lengths made to order.

## BRASS UNIONS—WITH GROUND JOINTS.



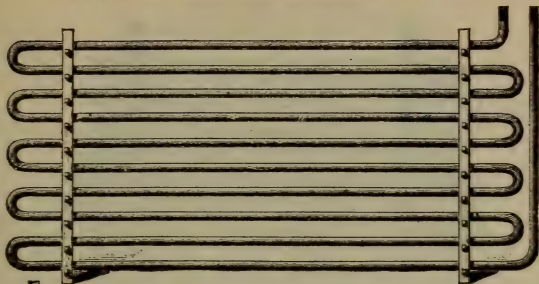
	Inch	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Rough, each.....		.35	.40	.55	.75	1.00	1.40	1.90	2.75	4.00	6.50	8.50
Finished, ".....		.32	.36	.50	.70	.90	1.25	1.70	2.50	3.60	6.00	7.75



## STEAM COILS AND BENDS.

IRON,  
BRASS,  
OR  
COPPER  
PIPE.

ANY  
SHAPE,  
TO  
ORDER.



TROMBONE COIL.



SPIRAL COIL.

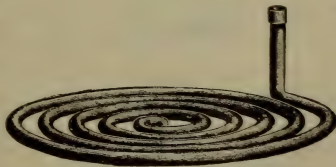
Coil Work and Pipe Bending  
Of Every Description.

We will be pleased to quote  
price upon receipt of sketch.



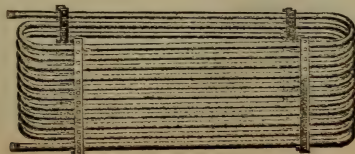
SPIRAL COIL.

All coils and  
bends are tested  
to 600 lbs. air  
pressure, or  
1,000 lbs. hy-  
draulic press-  
ure.



FLAT COIL.

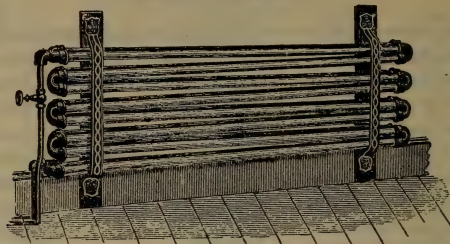
We carry in  
stock all sizes of  
Iron, Brass or  
Copper Pipe or  
Tubing to en-  
able us to fill all  
orders promptly



OBEONG COIL.

**BRACKET COILS.**

MADE OF 1-INCH PIPE.

**12 PIPES HIGH.**

Length, Feet.....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot, 2 Pipes Wide.....	.21½	.22	.22½	.23	.23½	.24½	.25½	.26½	.27½	.29½
Per Foot, 1 Pipe Wide.....	.23	.23½	.24	.24½	.25	.26	.27	.28	.29	.31

**10 PIPES HIGH.**

Length, Feet.....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot, 2 Pipes Wide.....	.22½	.23	.23½	.24	.24½	.25½	.26½	.27½	.28½	.30½
Per Foot, 1 Pipe Wide.....	.24	.24½	.25	.25½	.26	.27	.28	.29	.30	.32

**8 PIPES HIGH.**

Length, Feet.....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot, 2 Pipes Wide.....	.23½	.24	.24½	.25	.25½	.26½	.27½	.28½	.29½	.31½
Per Foot, 1 Pipe Wide.....	.25	.25½	.26	.26½	.27	.28	.29	.30	.31	.33

**6 PIPES HIGH.**

Length, Feet.....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot, 2 Pipes Wide.....	.24½	.25	.25½	.26	.26½	.27½	.28½	.29½	.30½	.32½
Per Foot, 1 Pipe Wide.....	.26	.26½	.27	.27½	.28½	.29	.30	.31	.32	.34

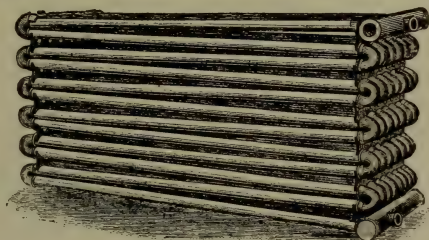
The above prices are based on coils made of whole pipe without couplings.

**COIL STANDS, SLATS, ETC.**

Ornamental Coil Stand (Light Pattern).....	} Market Rates.
Ornamental Coil Stand (Heavy Pattern).....	
Ornamental Coil Stand for Wall Coils.....	
Slats for Plain and Ornamental Coils.....	
Malleable Straps for Plain Box Coils.....	
Wrought-Iron Coil Rods.....	
Wrought-Iron Bracket Coil Rods.....	

**PLAIN BOX COILS.**

MADE OF 1-INCH PIPE.

**12 PIPES HIGH.**

Length, Feet ....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot.....	.20	.20½	.21	.21½	.22	.23	.24	.25	.26	.28

**10 PIPES HIGH.**

Length, Feet ....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot.....	.20½	.21	.21½	.22	.22½	.23½	.24½	.25½	.26½	.28½

**8 PIPES HIGH.**

Length, Feet ....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot.....	.21	.21½	.22	.22½	.23	.24	.25	.26	.27	.29

**6 PIPES HIGH.**

Length, Feet ....	8	7	6	5½	5	4½	4	3½	3	2½
Per Foot.....	.21½	.22	.22½	.23	.23½	.24½	.25½	.26½	.27½	.29½



**Favorite Radiator.**

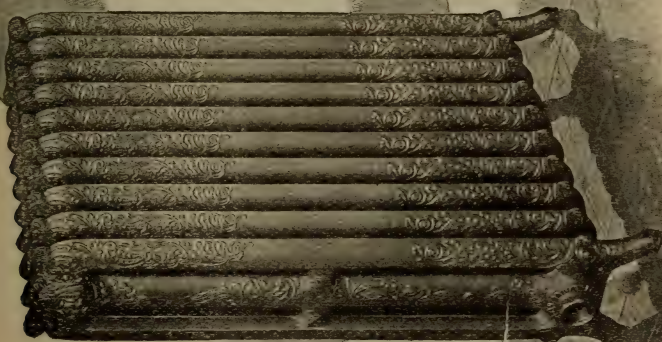


**Buffalo Standard Three-Column  
Ornamental Radiator.**





National Single-Column Radiator.



Rococo Ornamental Radiator.

PER SQUARE FOOT OF HEATING SURFACE. SUBJECT TO CHANGE WITHOUT NOTICE.

[illegible]

# Price List Direct Radiation.—Continued

PER SQUARE FOOT OF HEATING SURFACE. SUBJECT TO CHANGE WITHOUT NOTICE

Height, inches.....	45	44	38	33	32	31	30	28	26	25	24	23	22	20	19	18	16	15	14	13
Price per square foot.....	41c	41c	42c	46c	46c	46c	46c	48c	49c	49c	49c	53c	53c	57c	57c	58c	60c	62c	64c	66c
St. Louis Standard Single-Column, Ornamental, steam or water.....	.....	3½	3	.....	2½	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis Standard Single-Column, Plain, steam or water.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis Standard Two-Column, Ornamental and Plain, steam and water.....	5	.....	4	.....	3½	.....	.....	.....	2½	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
St. Louis Standard Three-Column, Ornamental and Plain, steam and water.....	.....	6	5	.....	4½	.....	.....	.....	3¾	.....	.....	.....	3	2¾	.....	2¼	.....	.....	.....	.....
St. Louis Standard Four-Column, Ornamental, steam or water.....	.....	9	8	.....	6½	.....	.....	.....	5½	.....	.....	.....	4	3½	.....	3	.....	.....	.....	.....
St. Louis Standard Four-Column, Plain, steam or water.....	.....	.....	8	.....	6½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis Window, steam or water.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Verona, steam and water.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Zenith Flue, steam and water.....	.....	.....	4	.....	3½	.....	.....	.....	2½	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
Zenith Narrow, steam and water.....	.....	.....	7	6	.....	.....	.....	5	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....
Zenith Window, steam or water.....	.....	.....	4½	4	.....	.....	.....	3½	.....	.....	.....	2¾	.....	.....	.....	.....	.....	.....	.....	.....

Figures in the above columns opposite names of patterns indicate the heights in which the various patterns are made, and the figures themselves represent the amount of heating surface contained in each height section.

## Price List of Indirect Radiation

Per Section	Per Section
Primus, water, 8 square feet.....	\$2 16
Excelsior, steam and water, 12 square feet.....	3 24
Excelsior Jr., steam, 8 square feet.....	2 16
Perfection Pin, Standard Size, steam or water, 10 sq. feet.....	2 70
Standard Pin, steam or water, 12 square feet.....	3 24
Standard Pin, steam or water, 15 square feet.....	4 05

	Per Section
Perfection Pin, Extra Large, steam or water, 15 sq. feet.....	\$4 05
Cardinal, steam or water, 15 square feet.....	4 05
Sterling, steam or water, 20 square feet.....	5 40
Sanitary School Pin, steam or water, 20 square feet.....	5 40
Gold Pin, steam or water, 15 square feet.....	4 05

## Tapping List of American Radiators

### STEAM

#### ONE-PIPE WORK

Radiators containing 24 square feet and under .....	1 inch
Above 24, but not exceeding 60 feet .....	1½ inch
Above 60, but not exceeding 100 feet .....	1½ inch
Above 100 square feet .....	2 inch

#### TWO-PIPE WORK

Radiators containing 48 square feet and under .....	1 x ¾ inch
Above 48, but not exceeding 96 feet .....	1½ x 1 inch
Above 96 square feet .....	1½ x 1½ inch

### HOT WATER

#### TAPPED FOR SUPPLY AND RETURN

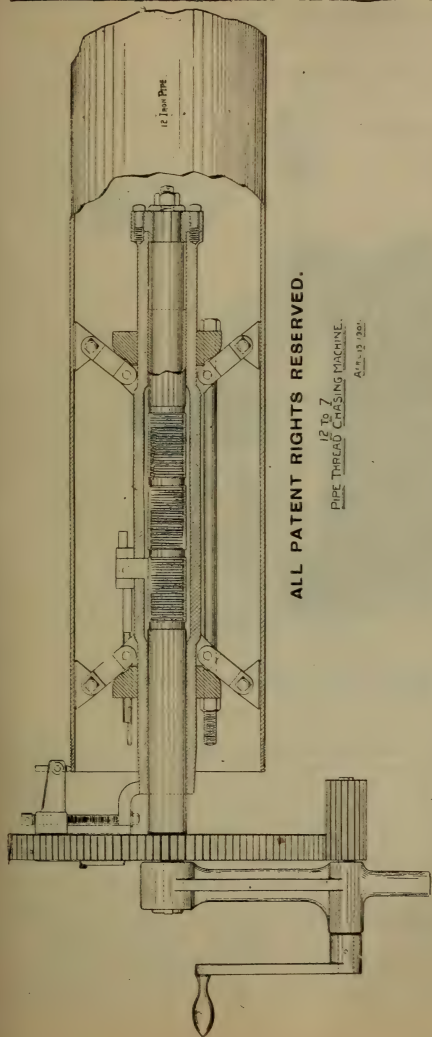
Radiators containing 40 square feet and under .....	1 inch
Above 40, but not exceeding 72 square feet .....	1½ inch
Above 72 square feet .....	1½ inch

## Measurements of American Radiators

Width, inches		Name of Radiator	Length occupied in Stack by each Section, inches
Legs	Inter- mediate Sections	Directs	
12½	12½	Aetna Flue .....	*3
5½	5½	Buffalo Single-Column .....	2½
8½	7½	Buffalo Two-Column .....	2½
9½	8½	Buffalo Three-Column .....	2½
12	11½	Buffalo Four-Column .....	2½
8½	8	Detroit Ornamental and Plain ..	*2½ <sup>16</sup>
12½	12½	Detroit Flue .....	*3
8½	7½	Excelsior .....	2
9½	7½	Favorite .....	2½
8½	7½	Ideal .....	*2½
8½	8½	Italian Flue .....	*3
5½	4½	National Single-Column .....	*2½
8½	7½	National Two-Column .....	*2½
11½	10½	National Four-Column .....	*2½
9½	8½	Occident .....	2½
9½	8½	Orient .....	2½
5½	4½	Peerless Single-Column .....	*2½
8½	7½	Peerless Two-Column .....	*2½
10½	10	Peerless Three-Column .....	*2½
11½	10½	Peerless Four-Column .....	*2½
9½	7½	Perfection .....	*2½
10½	10	Rococo Ornamental and Plain ..	*2½
6½	5½	St. Louis Single-Column .....	2½
8½	7	St. Louis Two-Column .....	2½
9½	9	St. Louis Three-Column .....	2½
12½	11½	St. Louis Four-Column .....	2½
11½	11½ <sup>16</sup>	St. Louis Window .....	2½
8½	8	Verona .....	*2½
9½	8½	Zenith Flue .....	
6	5½	Zenith Narrow .....	
12½	12½	Zenith Window .....	

\* To length of these Radiators add ½ inch for each bushing.





ALL PATENT RIGHTS RESERVED.

1 1/2 TO 7  
PIPE THREAD CHASING MACHINE.  
PAT. 13 1304.

## Johnston Pipe Thread Chasing Machine.

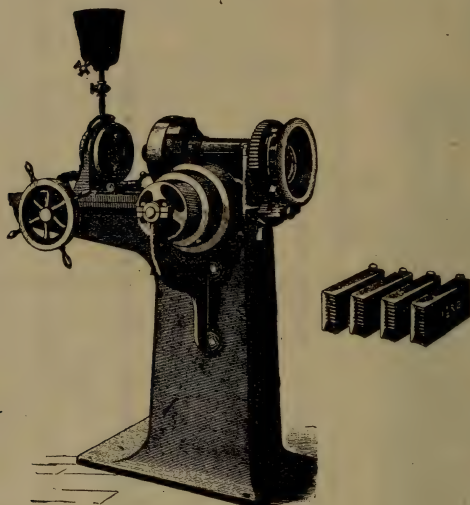
This machine is made in two sizes. Number One cuts thread on from 7 to 12-inch pipe. Number Two cuts threads on from 12 to 20-inch pipe.

Price, Number 1.....	\$400 00
Price, Number 2.....	800 00

Subject to Discount.

Send for Special Catalogue on this machine

## PIPE MACHINE. No. 7.

 $\frac{1}{4}$  TO 2 IN. QUICK OPENING, ADJUSTABLE DIES.

BACK VIEW

Speed of Countershaft, 200 Revolutions.  
 Diameter of Pulleys, one tight and two loose, 12 in. for 3 in. belt.  
 Cone has 3 steps for 3 in. belt.

Price, No. 7 Pipe Machine, including Right-Hand Dies,  $\frac{1}{4}$  to 2 in., and Countershaft,

106 00

" Oil Pump, extra,

15 00

			One Set Cuts these two Sizes.	One Set Cuts these two Sizes.	One Set Cuts these two Sizes.	One Set Cuts these two Sizes.
			$\frac{1}{4}$ & $\frac{1}{2}$	$\frac{1}{2}$ & $\frac{3}{4}$	1 & $1\frac{1}{4}$	$1\frac{1}{4}$ & 2
"	{ Extra Dies, 4 Sets Pipe Dies, Right or Left, at \$2.50 per Set,	10 00				

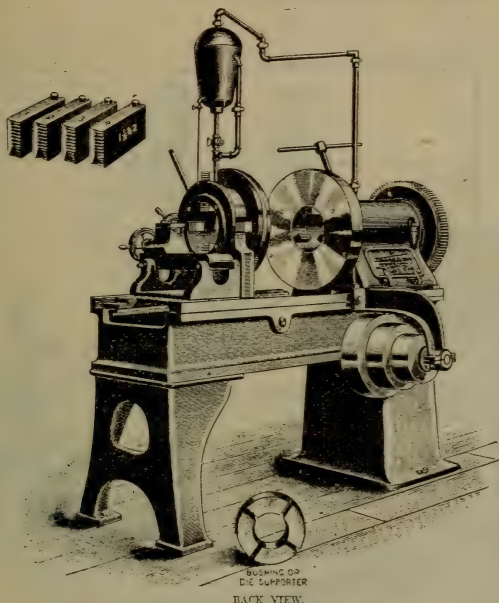
Price, No. 9 Pipe Machine, including Right-Hand Dies, 1 to 4 in., and Countershaft,

425 00

			One Set Cuts these two Sizes.	One Set Cuts these two Sizes.	One Set Cuts these two Sizes.	One Set Cuts these two Sizes.
			1 & $1\frac{1}{4}$	$1\frac{1}{2}$ & 2	$2\frac{1}{2}$ & 3	$3\frac{1}{2}$ & 4
"	{ Extra Dies, 4 Sets Pipe Dies, Right or Left, at \$4.00 per Set,	16 00				

## PIPE MACHINE, No. 11.

1½ TO 6 IN. QUICK OPENING, ADJUSTABLE DIES.



Speed of Countershaft, 200 Revolutions.

Diameter of Pulleys, one tight and two loose, 14 in. for 4 in. belt.

Cone has 3 steps for 3½ in. belt.

When threading 4 in. and smaller, always insert Bushing or Die Supporter into Die Head to stiffen the Dies. This Machine has six changes of speed, without removing or replacing gears.

Price, No. 11 Pipe Machine, including Right-Hand Dies, 1½ to 6 in., and Countershaft, 550 00

	One Set Cuts these two Sizes	One Set Cuts these two Sizes	One Set Cuts these two Sizes	One Set cuts these two Sizes	
Extra Dies, 5 Sets Pipe Dies, Right or Left, at \$4.50 per Set, 22 50	1½ & 2	2½ & 3	3½ & 4	4½ & 5	6

Price, No. 13 Pipe Machine, including Right-Hand Dies, 2½ to 6 in., and Countershaft, 900 00

	One Set Cuts these two Sizes	One Set Cuts these two Sizes	One Set Cuts these two Sizes	
Extra Dies, 6 Sets Pipe Dies, Right or Left, at \$7.00 per Set, 42 00	2½ & 3	3½ & 4	4½ & 5	6 | 7 | 8

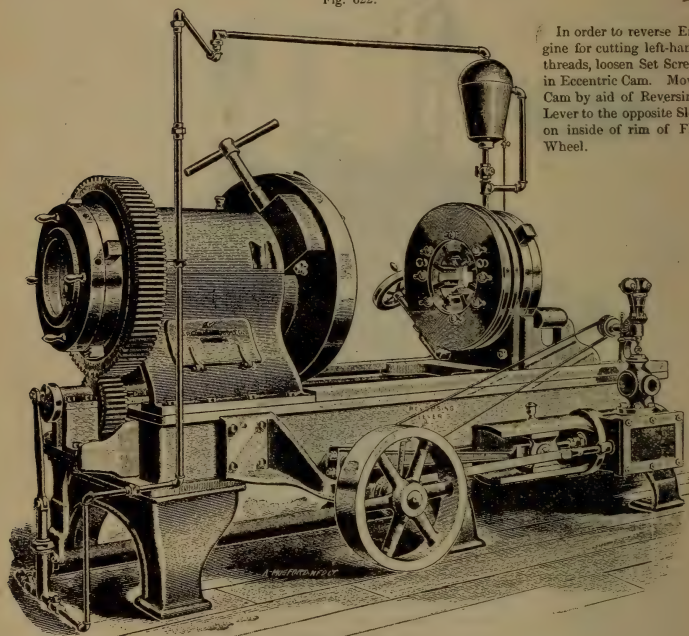
Cutting-off Knife

1 00

## PIPE MACHINE, No. 20.

7 TO 16 IN. QUICK OPENING, ADJUSTABLE DIES.

Fig. 622.



In order to reverse Engine for cutting left-hand threads, loosen Set Screw in Eccentric Cam. Move Cam by aid of Reversing Lever to the opposite Slot on inside of rim of Fly Wheel.

BACK VIEW.

Dimensions of Cylinder, 6 x 8 in. Governor Pulley provided with steps for changing speed of Engine. The Fly Wheel has a  $4\frac{1}{2}$  in. face for belting to a line shaft, if desired, for operating other machinery. The Engine is so arranged that by the movement of a Lever it can be disconnected from the Pipe Machine part.

When threading 12 in. and smaller, always insert the Bushing or Die Supporter into Die Head to stiffen the Dies.

Price, No 20 Pipe Machine, including Right-Hand Dies, 7 to 16 in.,

2,100 00

Extra Dies, 7 Set Pipe Dies, Right or  
Left, at \$16 00 per Set,

112 00

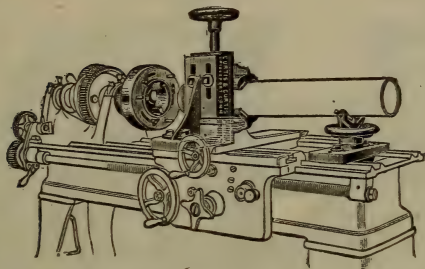
7	8	9	10	12	14	16
---	---	---	----	----	----	----

" Cutting-off Knife,

1 50



## PIPE THREADING ATTACHMENT FOR LATHES.



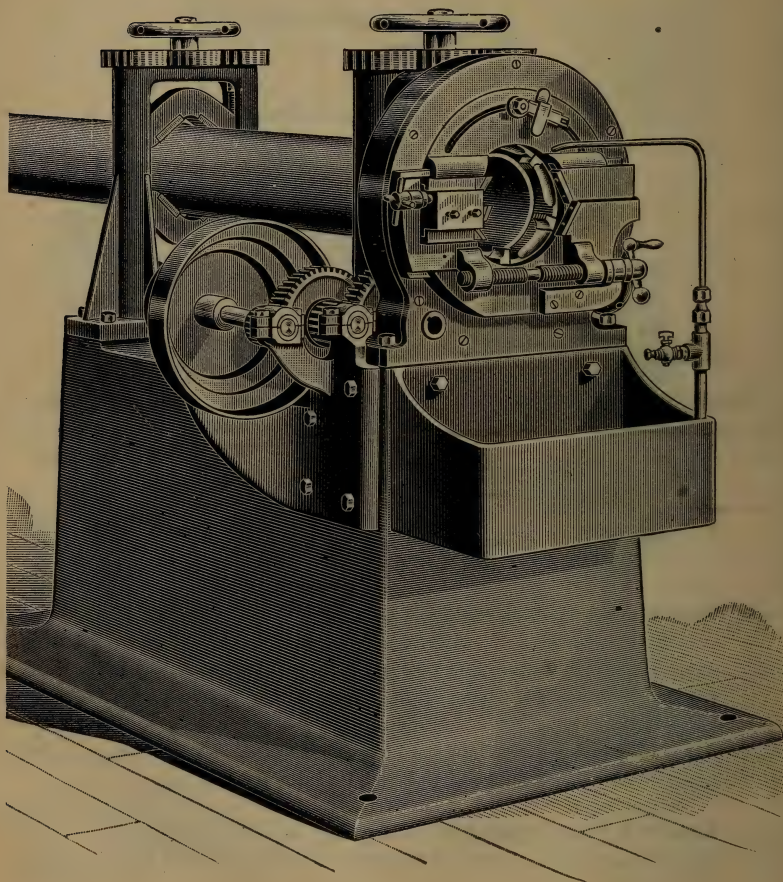
This attachment consists of a die head and dies to be mounted on the spindle like a chuck, and adjustable vise to be attached to the carriage and an adjustable pipe rest. Will do rapid and accurate work.

### PRICE LIST.

#### PIPE THREADING ATTACHMENT FOR LATHES.

No. 1.	Range $\frac{1}{4}$ to 2 inch. Both Right and Left, for lathe not less than 10-in. swing.....	\$ 50.00
No. 2.	Arranged for solid Pipe or Bolt Dies, but without dies.....	33.00
No. 3.	(For Bolts), Range $\frac{1}{4}$ to 2 inch, without dies..... Bolt dies \$3.00 per set of three extra)	40.00
No. 6.	Range 1 to 4 inch. Right Hand, for lathe not less than 15-inch swing....	75.00
No. 8.	Range 1 to 4 inch. Right and Left Hand, for lathe not less than 15-inch swing.....	95.00
No. 10.	Range $2\frac{1}{2}$ to 6 inch. Right Hand, for lathe not less than 20-inch swing...	130.00
No. 12.	Range $2\frac{1}{2}$ to 8 inch. Right Hand, for lathe not less than 28-inch swing...	225.00

The "Columbus" Double Vise Pipe Threading  
and Cutting Machine.



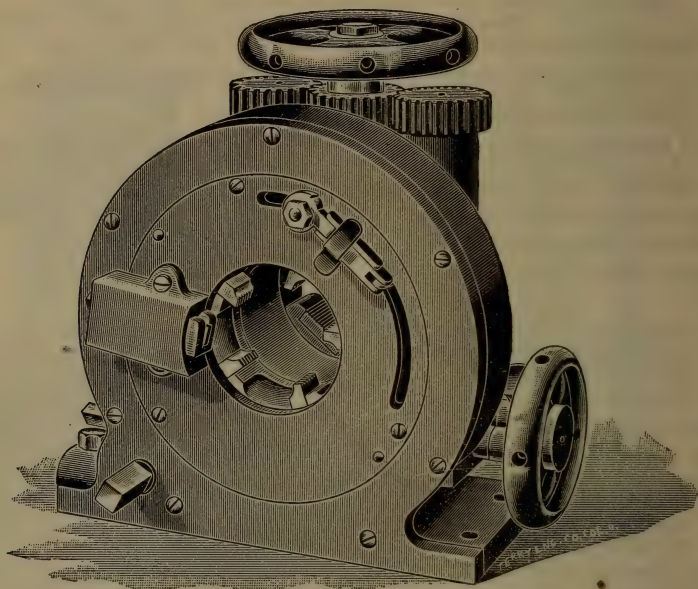
## Prices of "Columbus" Pipe Threading and Cutting Machines.

No. 5 Machine complete with countershaft and two sets of chasers (5 to a set) for threading 1 inch to 4 inch pipe, weight 950 lbs.	\$200 00
Speed of countershaft 280 revolutions per minute.	
No. 6. Machine complete with countershaft and three sets of chasers (5 to a set) for threading 1 inch to 6 inch pipe, weight 1150 lbs.	300 00
Speed of countershaft 240 revolutions per minute	
No. 7 Machine complete with countershaft and three sets of chasers (5 to a set) for threading 2½ inch to 8 inch pipe, weight 1525 lbs.	550 00
Speed of countershaft 220 revolutions per minute.	
Extra chasers per set . . . . .	4 00
Left-hand chasers per set . . . . .	5 00
Casing chasers per set . . . . .	5 00

### DOUBLE VISE MACHINES.

No. 8 Machine with countershaft, and three sets of chasers, (five chasers to a set). for threading 1 inch to 6 inch pipe. Weight, 2300 lbs. Price . . . . .	400 00
Speed of countershaft, 220	
Extra chasers per set . . . . .	4 00
Left-hand and casing chasers per set . . . . .	5 00
No. 9 Machine complete with countershaft, and three sets of chasers, (five chasers to a set), for threading 2½ inch to 8 inch pipe. Weight 3000 lbs. Price . . . . .	650 00
Speed of countershaft 230.	
Extra chasers per set . . . . .	4 00
Left-hand and casing chasers per set . . . . .	5 00
No. 10 Machine complete with countershaft, and four sets of chasers, (six to a set), for threading 2½ inch to 10 inch pipe. Weight 4500 lbs. Price . . . . .	900 00
Speed of countershaft, 220.	
Extra chasers per set . . . . .	5 00
Left-hand and special chasers per set . . . . .	6 00
No. 11 Machine complete with countershaft, and five sets of chasers, (eight to a set), for threading 2½ inch to 12 inch pipe. Weight, 6000 lbs. Price . . . . .	1250 00
Speed of countershaft, 220.	
Extra chasers, per set . . . . .	6 00
Left-hand and special chasers, per set . . . . .	7 00

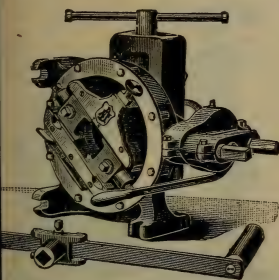
## The "Columbus" Portable Hand Pipe Threading and Cutting Machine.



No. 2 Machine complete with two sets of Chasers (5 to a set) for threading 1 inch to 4 inch pipe, with extensible crank and ratchet lever, weight 300 lbs. ....	\$110 00
No. 3 Machine complete with three sets of Chasers (5 to a set), for threading 1 inch to 6 inch pipe, weight 450 lbs. ....	190 00
No. 4 Machine complete with three sets of Chasers (5 to a set), for threading 2½ inch to 8 inch pipe, weight 675 lbs. ....	350 00
Extra Chasers, per set. ....	4 00
Left-hand Chasers, per set. ....	5 00
Casing Chasers, per set. ....	5 00



# ARMSTRONG PIPE THREADING MACHINES.



No. O Hand Machine  $\frac{1}{4}$  to 2, R. H. Pipe, \$60.00

„ O „ „  $\frac{1}{2}$  to  $1\frac{1}{2}$  Bolts, . . . 60.00

„ O Power Machine  $\frac{1}{2}$  to  $1\frac{1}{2}$ , Bolts, . . . 103.00

„ O „ „  $\frac{1}{4}$  to 2, R. H. Pipe, 103.00

Stand for above Machine, . . . 10.00

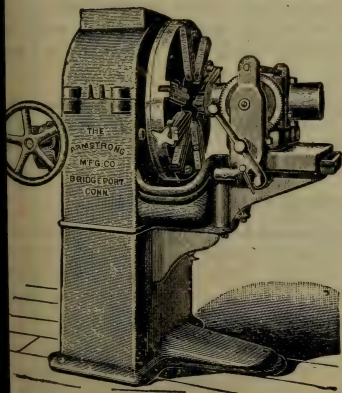
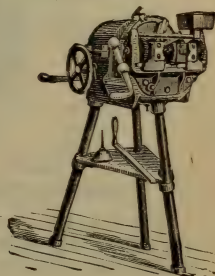
No. OO Hand Machine 1 to 4, R. H. Pipe, 125.00

„ OO Power Machine 1 to 4 R. H. „ . . . 195.00

Stand for above Machine . . . 20.00

No. 1 Hand Machine 1 to 3, R. H. Pipe, . . . \$115.00

No. 1 Power Machine 1 to 3, R. H. Pipe, . . . 170.00



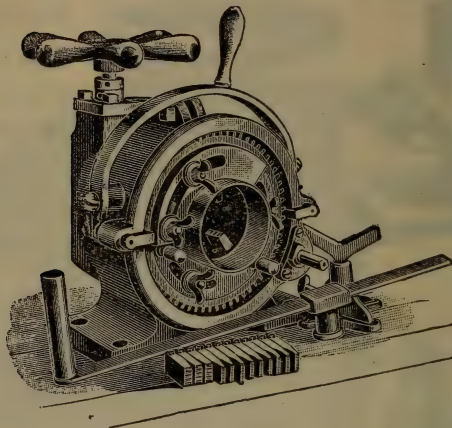
No  $1\frac{1}{2}$  Power Machine

Threads Pipe 1 to 4, R. H. . . . \$316.00

No. 3 Power Machine

Threads Pipe 1 to 6, R. H. . . . 550.00

All these Machines are Adjustable to Variations in Fittings.

**No. 30, HAND MACHINE.**Range  $\frac{1}{4}$  to 2 inches R. and L.

In presenting these Machines we would ask your Attention to the Following Points:

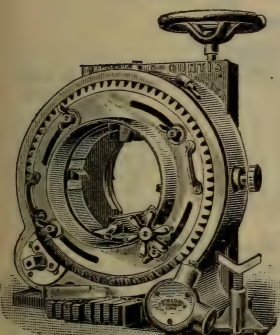
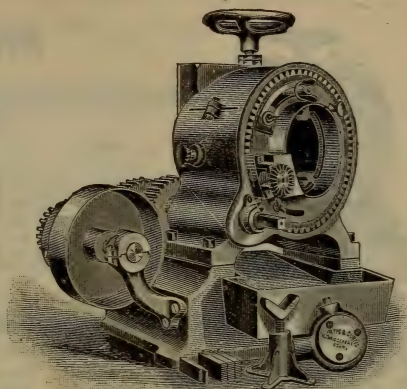
It is the only portable hand machine in the market with which one man can cut off and thread large pipe up to 12 inches diameter without assistance, while with the smaller sizes of machines a boy will thread two and three inch pipe with only one hand on the crank.

Its dies can be sharpened by grinding without drawing temper, and when one of a set is lost or broken, a new one can be supplied without replacing the set. They draw back out of the way when the thread is cut, yet always cut standard sizes, and are adjustable to any variation of fittings.

The shells are adjustable for wear, which greatly prolongs the life of the machine.

These machines consist of a die-carrying gear surrounded and supported by a shell with a pipe vise attached to the back of it and a pinion or small gear imbedded in its side; and a face plate by which the dies are adjusted. The pipe is pushed into the machine from the back and clamped in the vise by the hand wheel shown on top of the machine. The die-carrying gear is then revolved by means of the crank and pinion.

All sizes of machines have cut-off attachments except Nos. 30, 32, 34, 36 and 37. On these sizes we do not place cut-off attachments as on such small sizes our customers generally prefer one of our quick adjusting roller cutters. We can, however, do so, if desired, for pipe one-half inch diameter and upwards, at an expense of \$10.00 additional.

**HAND MACHINE.**Range  $2\frac{1}{2}$  to 6 in., R. H.**HAND OR POWER MACHINE.**Range  $2\frac{1}{2}$  to 4 in., R. H.**Net Price List for Hand or Power Machines.**

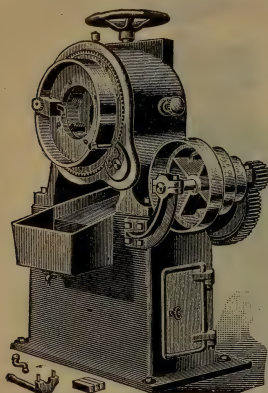
NUMBER.		RANGE.	PRICE.	
Hand.	Power.		Hand.	Power.
*30	*70	$\frac{1}{4}$ to 2 inch R. and L.	\$ 50.00	\$100.00
*32	*72	$\frac{1}{4}$ to 2 inch for Solid Dies (without dies.)	45.00	95.00
*34	*74	1 to 3 inch R. H., 1 to 2 inch L. H.	75.00	125.00
*36	*76	$\frac{3}{4}$ to 3 inch R. H., $\frac{3}{4}$ to 2 inch L. H.	85.00	135.00
*37	*77	$\frac{1}{4}$ to 3 inches, R. and L.	105.00	155.00
†46	†78	$2\frac{1}{2}$ to 4 inches, R. H.	85.00	140.00
*38	*80	$1\frac{1}{2}$ to 4 inches, R. H.	100.00	150.00
*40	*82	$1\frac{1}{2}$ to 4 inches, R. and L.	115.00	165.00
*42	*84	1 to 4 inches, R. H.	110.00	160.00
*44	*86	1 to 4 inches, R. and L.	130.00	180.00
†50	†88	4 to 6 inches, R. H.	115.00	170.00
†52	†90	$3\frac{1}{2}$ to 6 inches, R. H.	130.00	180.00
†54	†92	$2\frac{1}{2}$ to 5 inches, R. H.	150.00	200.00
†56	†94	$2\frac{1}{2}$ to 6 inches, R. H.	175.00	225.00
*58	*96	1 to 6 inches, R. H.	190.00	250.00
*60	*98	1 to 6 inches, R. and L.	235.00	285.00
*63	*99	$2\frac{1}{2}$ to 8 inches, R. and L.	360.00	535.00
†64	†100	$2\frac{1}{2}$ to 8 inches, R. H.	325.00	500.00
†66	†102	$2\frac{1}{2}$ to 10 inches, R. H.	500.00	700.00
*67	*104	$2\frac{1}{2}$ to 10 inches, R. H.	500.00	700.00
*68	*106	$2\frac{1}{2}$ to 10 inches, R. and L.	550.00	750.00
†69	†107	$2\frac{1}{2}$ to 12 inches, R. H.	650.00	900.00
*69½	*108	$2\frac{1}{2}$ to 12 inches, R. and L.	750.00	1000.00

\* Pressure feed machine.

† Lead screw machine.

These prices include counter-shaft, ratchet wrench and pipe rest.

Nos. 70 to 77 have no cut-off attachment unless specially ordered.

**POWER MACHINE.****PIPE MILL MACHINES.****Net Price List.**

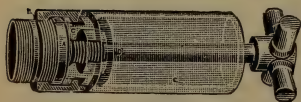
NO.	RANGE.	PRICE.	FLOOR SPACE.
*109	1 to 6 inch R. H. ....	\$ 410.00	36x40 in.
†110	2½ to 6 inch R. H. ....	400.00	36x40 in.
*111	1 to 6 inch R. and L. ....	430.00	36x40 in.
†112	2½ to 8 inch R. H. ....	650.00	39x39 in.
*114	2½ to 8 inch R. and L. ....	750.00	39x39 in.
†116	2½ to 12 inch R. H. ....	1200.00	47x65 in.

\*Pressure feed machine. †Lead Screw machine.

These machines are of the same general description as those already described, but are much stronger and powerful. They are especially designed for heavy pipe mill work. For ten dollars extra we fit them with a hand wheel so they can be run by hand in case of necessity.

**THE CURTIS NIPPLE HOLDER.**

A single revolution of the hand wheel allows the nipple to be unscrewed by the fingers.



NO.	RANGE.	PRICE.
1	¼ to 2 inch R. and L. ....	\$14.00
1½	1 to 3 inch R. and L. ....	18.00
2	1 to 4 inch R. and L. ....	40.00
3	1 to 6 inch R. and L. ....	60.00
4	2½ to 8 inch R. and L. ....	85.00

**THE CURTIS PIPE CUTTER.**

(Quick adjustment.)

NO.	RANGE.	PRICE.
2	⅛ to 2 inch. ....	\$6.00



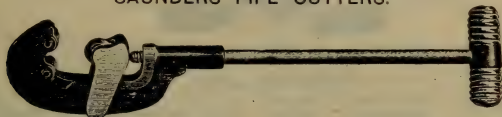


## THREE WHEEL PIPE CUTTERS.



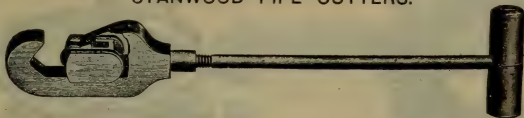
Number .....	1	2	3	4	5
Cuts Pipe, inches .....	$\frac{1}{8}$ to 1	$\frac{1}{2}$ to 2	$1\frac{1}{2}$ to 3	$2\frac{3}{4}$ to 4	4 to 6
Each .....	4.50	6.00	10.00	20.00	30.00
Extra Wheels, each .....	.25	.30	.40	.50	.75
Extra Pins, each .....	.10	.10	.10	.20	.20

## SAUNDERS PIPE CUTTERS.



Number .....	1	2	3	4
Cuts Pipe, inches .....	$\frac{1}{8}$ to 1	1 to 2	2 to 3	$2\frac{3}{4}$ to 4
Each .....	3.00	4.50	11.00	18.00
Extra Blocks and Wheels, each .....	1.25	1.75	2.75	3.50
Extra Wheels, each .....	.24	.32	.60	.60
Extra Rollers, " .....	.24	.32	.50	.50
Extra Pins, each .....	.10	.10	.15	.15

## STANWOOD PIPE CUTTERS.



Number .....	1	2	3
Cuts Pipe, inches .....	$\frac{1}{8}$ to 1	$\frac{3}{4}$ to 2	2 to 3
Each .....	1.50	2.25	7.00
Extra Blocks and Wheels, each .....	.45	.60	1.25
Extra Wheels, each .....	.12	.18	.25
Extra Pins, each .....	.05	.05	.10

## TRIMO PIPE CUTTERS.



Number .....	1	2	3
Cuts Pipe, inches .....	$\frac{1}{8}$ to $1\frac{3}{4}$	$\frac{1}{2}$ to 2	$1\frac{3}{4}$ to 3
Each .....	4.25	6.25	12.25
Extra Nuts, each .....	.35	.35	.40
Extra Wheels, each .....	.30	.30	.40
Extra Rolls, each .....	.25	.30	.50
Extra Fork Block Carriers, each .....	.10	.10	.10
Extra Pins with Cotter Pins, per dozen .....	1.00	1.00	1.00
Extra Washers, per dozen .....	.60	.60	.60

## PIPE STOCKS AND DIES

HART'S PATENT  
"DUPLEX" DIE STOCK  
FOR PIPE.



Both Guides and Dies Instantly Adjustable.

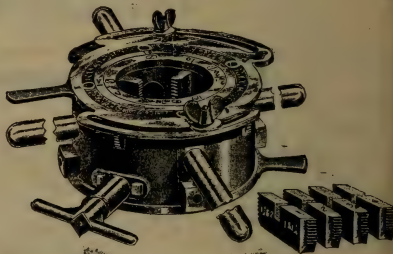
## PRICE LIST

FOR THREADING.				WITHOUT CUT-OFF.		WITH CUT-OFF.		PRICES OF EXTRA DIES.			
No. 1.	$\frac{1}{8}$ .	$\frac{3}{8}$ .	$\frac{1}{2}$ .	Pipe.	\$13 00	\$18 00	No. 1.	Per Single Set, (4 pcs.) right or left hand	.....	\$1 50	
No. 2.	$\frac{1}{4}$ .	$\frac{1}{2}$ .	$\frac{3}{4}$ .	"	17 00	20 00	No. 2.	"	"	"	1 75
No. 3.	$\frac{1}{2}$ .	$\frac{3}{4}$ .	$1\frac{1}{4}$ .	"	22 00	25 00	No. 3.	"	"	"	2 00
No. 3½.	$\frac{3}{4}$ .	$1\frac{1}{4}$ .	$1\frac{3}{4}$ .	"	25 00	28 00	No. 3½.	"	"	"	2 00
No. 4.	$1\frac{1}{4}$ .	$1\frac{3}{4}$ .	$2\frac{1}{4}$ .	"	40 00	45 00	No. 4.	"	"	"	3 50
No. 5.	$2\frac{1}{4}$ .	$3\frac{1}{4}$ .	$4\frac{1}{4}$ .	"	55 00	60 00	No. 5.	"	"	"	4 00

## THE "OSTER"



## JARECKI PATENT



No. of Tool.	Sizes of Pipe each Tool will thread and cut.	With Cut-off.	With Cut-off.
0	$\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$	\$12 00	\$15 00
1	$\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$	13 00	18 00
1½A	$\frac{3}{8}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{4}$	14 00	17 00
2	$\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{4}$ , $1\frac{3}{4}$	17 00	20 00
3	$1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$ , $2\frac{3}{4}$	22 00	26 00
4	$\frac{3}{4}$ , $1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$	25 00	28 00
4½	$1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$ , $2\frac{3}{4}$	28 00	31 00
5	$1\frac{3}{4}$ , $2\frac{1}{4}$ , $2\frac{3}{4}$ , $3\frac{1}{4}$	40 00	45 00
6	$2\frac{1}{4}$ , $3\frac{1}{4}$ , $4\frac{1}{4}$	55 00	60 00

## PRICES OF EXTRA DIES.

Per set (4 pieces), right or left.

No. 0	\$1 25	No. 2	\$1 75	No. 4½	\$2 50
No. 1	1 50	No. 3	2 00	No. 5	3 00
No. 1½A	1 50	No. 4	2 00	No. 6	3 50
No. 7	2 50	No. 8	3 50	No. 9	4 50
		No. 9½	4 50		

No.	Thread and Cuts.	Price.	Shipping Weight, boxed.
1	$\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{3}{8}$ , $\frac{1}{2}$	\$ 14 00	12 Pounds.
2	$\frac{1}{4}$ , $\frac{3}{8}$ , $1\frac{1}{4}$ , $1\frac{3}{4}$	16 00	24 "
3	$1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$ , $2\frac{3}{4}$	20 00	32 "
3½	$\frac{3}{4}$ , $1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$	22 50	34 "
4A	$1\frac{1}{4}$ , $1\frac{3}{4}$ , $2\frac{1}{4}$ , $2\frac{3}{4}$	35 00	84 "
4B	$2\frac{1}{4}$ , $2\frac{3}{4}$ , $3\frac{1}{4}$ , $3\frac{3}{4}$	50 00	88 "
5	$2\frac{3}{4}$ , $3\frac{1}{4}$ , $3\frac{3}{4}$ , $4\frac{1}{4}$	75 00	108 "
5A	$3\frac{1}{4}$ , $4\frac{1}{4}$ , $4\frac{3}{4}$ , $5\frac{1}{4}$	125 00	

Number.	1	2	3	3½	4A	4B	5	5A
Dies, per set, right or left hand.	\$2 00	\$2 00	\$2 00	\$4 00	\$3 00	\$3 00	\$6 00	\$6 00
Knives.	40	40	40	40	50	50	60	60

# REED'S STANDARD PIPE WRENCHES



## STANDARD PIPE WRENCHES.

### PRICE LIST.

Numbers show Length in Inches.	No. 8.	No. 11.	No. 16.	No. 20.	No. 30.	No. 40.
Takes from.....	3/4 in. Wire to 3/4 in. Pipe.	1/2 in. Pipe. to 1 in. Pipe.	3/4 in. Pipe. to 1 1/4 in. Pipe.	1 in. Pipe. to 2 in. Pipe.	1 1/4 in. Pipe. to 3 in. Pipe.	2 in. Pipe to 4 in. Pipe.
Price.....Each	2.00	2.25	3.00	4.00	9.00	12.00
Extra Jaw, including Rod	.67	.75	1.00	1.35	3.00	4.00
Facing, including Screws and Dowel Pins	.40	.45	.60	.80	1.50	2.00
Spring	.10	.10	.15	.20	.40	.50
Price, Nickelplated	2.50	3.00	4.00	5.00	12.00	15.00

## ROBBINS' CHAIN TONGS.



Numbers	2	3	4	5	6
Will take.....	1—4	1 1/4—5	2—7	2 1/2—10	2 1/2—12
Price.....	\$5.50	6.25	9.00	12.50	16.00
Length.....	27 in.	3 ft.	4 ft.	5 ft.	

## GAS PIPE PLIERS.

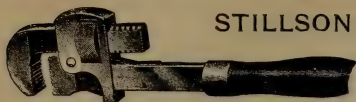
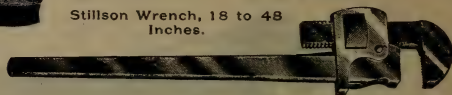


### BLACK HANDLES, POLISHED HEADS.

Length, inches	5	9	10	11	12	13	14
Per dozen	12.00	14.00	15.00	16.00	18.00	21.00	24.00

Polished complete, add \$2.00 to lists.

## STILLSON WRENCHES.

Stillson Wrench, Wood Handle,  
6 to 18 Inches.Stillson Wrench, 18 to 48  
Inches.

Length, when open.... Inches	6	8	10	14	18	24	36	48
Takes from.....	$\frac{1}{2}$ wire to $\frac{1}{2}$ pipe	$\frac{1}{2}$ wire to $\frac{3}{4}$ pipe	$\frac{1}{2}$ wire to 1 pipe	$\frac{1}{2}$ wire to 1 $\frac{1}{2}$ pipe	$\frac{1}{2}$ wire to 2 pipe	$\frac{1}{2}$ wire to 2 $\frac{1}{2}$ pipe	$\frac{1}{2}$ pipe to 3 $\frac{1}{2}$ pipe	1 pipe to 5 pipe
Price.....Each	2 00	2 00	2 25	3 00	4 00	6 00	12 00	18 00



Stillson Jaw.



Stillson Frame.



Stillson Handle.



Stillson Nut.

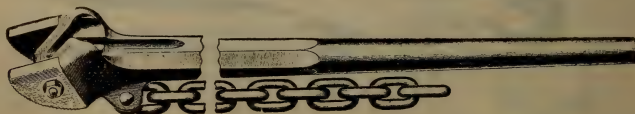
## REPAIRS FOR STILLSON WRENCHES.

Size.....Inches	6	8	10	14	18	24	36	48
Jaws.....Each	.67	.67	.75	1.00	1.33	2.00	4.00	6.00
Frames....."	.25	.25	.33	.45	.55	.65	.75	1.00
Wood Handles....."	.15	.15	.20	.25	.30	..	..	..
Steel Handles....."	.66	.66	.78	1.00	1.33	2.00	4.00	6.00
Nuts....."	.20	.20	.27	.35	.42	.50	.65	.80

## TRIMO WRENCHES AND PARTS.



Length, when open.... Inches	6	8	10	14	18	24	36	48
Takes from.....	$\frac{1}{2}$ wire to $\frac{1}{2}$ pipe	$\frac{1}{2}$ wire to $\frac{3}{4}$ pipe	$\frac{1}{2}$ wire to 1 pipe	$\frac{1}{2}$ wire to 1 $\frac{1}{2}$ pipe	$\frac{1}{2}$ wire to 2 pipe	$\frac{1}{2}$ wire to 2 $\frac{1}{2}$ pipe	$\frac{1}{2}$ pipe to 3 $\frac{1}{2}$ pipe	1 pipe to 5 pipe
Price.....Each	2 00	2 00	2 25	3 00	4 00	6 00	12 00	18 00
Jaw....."	.67	.67	.75	1.00	1.33	2.00	4.00	6.00
Nut....."	.20	.20	.27	.35	.42	.50	.65	.80
Inserted Jaw....."	.25	.25	.33	.50	.55	.65	1.00	1.25
Frame....."	.25	.25	.33	.45	.55	.65	.75	1.00



## Trimo Giant Wrench.

	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
Length of Lever, inches	27	37	50	60	72	84
Takes Pipe	$\frac{3}{4}$ to 3	1 to 4	2 to 6	2 $\frac{1}{2}$ to 10	3 to 12	4 to 18
Each	\$6 00	8 00	10 00	15 00	18 00	32 00
Extra Jaws, per pair	1 75	2 25	2 75	3 50	4 00	5 00



## COMMON PIPE TONGS.



Size.....Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price.....Each	1.00	1.00	1.25	1.50	1.75	2.00	2.40	3.00	3.75	4.75	5.50	6.50	7.50

## BROWNS' ADJUSTABLE TONGS.



Number.....	1	$1\frac{1}{2}$	2	3	4	5	6	7
Capacity.....Inches	$\frac{1}{8}$ to $\frac{3}{4}$	$\frac{3}{8}$ to 1	$\frac{1}{2}$ to $1\frac{1}{4}$	1 to 2	$1\frac{1}{2}$ to 3	$2\frac{1}{2}$ to 4	3 to 5	4 to 7
Price.....Each	1.30	1.65	2.00	3.00	6.00	11.00	25.00	35.00

## VULCAN CHAIN PIPE WRENCHES.



aWith Flat Link Chain

Size .....	No. 10.	No. 11	No. 12	No. 13	No. 13½	No. 14	No. 15	No. 16
Pride, with flat link chain, each	\$2 50	3 50	5 00	7 00	9 00	11 00	18 00	40 00
Price, with cable chain, each.	\$2 25	3 25	4 50	6 25	7 75	9 50	16 00	40 00
Capacity, size pipe.....	$\frac{1}{8}$ to $\frac{3}{4}$ in.	$\frac{1}{4}$ to $1\frac{1}{2}$ in	$\frac{3}{8}$ to $2\frac{1}{2}$ in	$\frac{1}{2}$ to 4 in	1 to 6 in.	$1\frac{1}{2}$ to 8 in.	2 to 12 in.	4 to 18 in
Length, over all .....	$13\frac{3}{4}$ in.	20 in	27 in.	37 in.	$44\frac{1}{2}$ in	$50\frac{1}{2}$ in	$64\frac{1}{2}$ in	87 in
Weight.....	$1\frac{1}{4}$ lbs.	$4\frac{3}{4}$ lbs	$8\frac{3}{4}$ lbs	16 lbs	21 lbs	29 lbs	49 lbs	130 lbs
Extra flat link chain, each .....	\$ 75	1 00	1 50	2 50	3 25	4 00	6 00	13 00
Extra cable chain, each.....	\$ 50	75	1 00	1 75	2 00	2 50	4 00	13 00
Extra jaws, pair.....	\$1 00	1 75	2 75	4 00	4 75	5 50	7 50	16 00
Length, flat link chain.....	$9\frac{1}{2}$ in.	$13\frac{1}{2}$ in	$17\frac{1}{2}$ in	$22\frac{1}{2}$ in	31 in	39 in	$54\frac{1}{2}$ in	$74\frac{1}{2}$ in.
Length, cable chain.....	$9\frac{3}{4}$ in.	$14\frac{1}{2}$ in.	18 in	27 in	$33\frac{1}{2}$ in	42 in	57 in	78 in
Breaking strain, flat link chain	3,000 lbs.	5,500 lbs.	9,500 lbs.	11,000 lbs.	13,000 lbs.	15,000 lbs.	20,000 lbs	40,000 lbs
Breaking strain, cable chain...	1,200 lbs.	4,000 lbs	6,000 lbs.	10,500 lbs.	12,500 lbs.	15,000 lbs.	18,000 lbs	40,000 lbs
Size iron in cable chain.....	$\frac{7}{8}$ in	$\frac{1}{2}$ in	$1\frac{1}{2}$ in	$\frac{3}{4}$ in	$1\frac{1}{2}$ in	$2\frac{1}{2}$ in	3 in	3 in

## COE'S GENUINE WRENCHES.



Size .....	Inches	4	6	8	10	12	15	18	21
Will Open .....		$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	3	$4\frac{1}{4}$
Black .....	Per Dozen	10.00	9.00	10.00	12.00	14.00	24.00	30.00	36.00
Bright .....		10.00	10.00	11.00	14.00	16.00	26.00	32.00	38.00

## PEASES' IMPROVED COMBINATION PLIERS.

Gas Pliers, Wire Cutters, Wrench and Screw-Driver Combined.



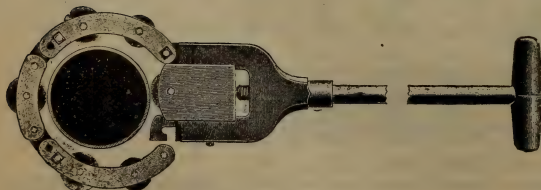
6 Inch.

6 inch ..... per doz., \$13 50



10 AND 14 INCH.

10 inch ..... per doz., \$18 00  
 14 " ..... " 24 00



## HALL'S.

For Cutting Cast Iron Pipe in the Trench.

For Use in Water Works Plants.

- No. 1. Cutter with 3 Loops for Cutting 4, 6 and 8 inch Pipe. .... Each, \$25 00  
 No. 2. Cutter with 3 Loops for Cutting 10, 12 and 14 inch Pipe. .... Each, 30 00  
 No. 3. Cutter with 4 Loop for Cutting 16, 18, 20 and 24 inch Pipe. .... Each, 40 00

## TRIPLE HEAD SET SCREW WRENCH.



The openings in this wrench will admit of finishing to a size larger than given in table.

For Set Screws— Sizes.	Length over all.	Thickn's of Head	Price Un- finished	Price Finished
$\frac{1}{2}$ $\frac{3}{8}$ $\frac{1}{4}$	5 $\frac{1}{2}$	$\frac{3}{8}$	\$ .28	\$ .56

## BULL TERRIER WRENCH.

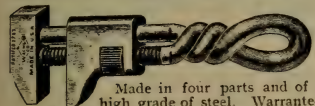


Sectional View.

The body of this wrench is drop-forged from solid steel and the jaws are made of special steel thoroughly hardened and tempered. Both jaws open and close at the same time by means of a hardened steel plunger which passes through a nut in center of wrench, making it very easy and quick to adjust to the different sizes of pipe without the use of springs. It is one of the neatest and strongest wrenches of its kind on the market, finely polished and nickel-plated. Manufactured in one size only, to take in pipe up to one inch diameter; weight, 10 ounces.

Price.....per dozen, \$15.00.

## IMPROVED "ACME" STEEL WRENCH.



Made in four parts and of a high grade of steel. Warranted not to break, bend or spring with ordinary use.

## PRICE LIST—Bright Standard Wrench.

6-in. per doz., \$ 9 00	12-in. per doz., \$14 00
8-in. per doz., 10 00	15-in. per doz., 24 00
10-in. per doz., 12 00	18-in. per doz., 30 00
21-in. .... per doz.	\$36 00

## "W &amp; B REGULAR WRENCH."



This wrench has extra heavy wrought bar and head, forged from one piece; deep milled screw thread; opens full. Every wrench fully warranted.

6-in. per doz., \$ 9 00	10-in. per doz., \$12 00
8-in. per doz., 10 00	12-in. per doz., 14 00
15-in. .... per doz.,	\$24 00

## "W &amp; B" MACHINISTS' SCREW WRENCH.

Knife Handle.



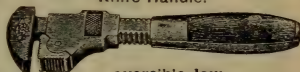
This wrench is especially adapted to mechanics' use and no pains have been spared in the mechanical construction, all of the parts being made from best material and accurately fitted. Every wrench guaranteed to give entire satisfaction.

## PRICE LIST—BLACK.

6-in. per doz., \$ 9 00	12-in. per doz., \$14 00
8-in. per doz., 10 00	15-in. per doz., 24 00
10-in. per doz., 12 00	18-in. per doz., 30 00
21-in. .... per doz.,	\$36 00

## "W. &amp; B." IMPROVED PIPE WRENCH.

Knife Handle.



versible Jaw.

Length . . . . .	6	8	10
Takes from . . . .	$\frac{1}{4}$ in. wire to $\frac{1}{2}$ in. pipe	$\frac{1}{4}$ in. wire to $\frac{1}{2}$ in. pipe	$\frac{1}{4}$ in. wire to 1 in. pipe
Price, each . . . .	\$2 00	2 00	2 25
Length . . . . .	14	18	24
Takes from . . . .	$\frac{1}{4}$ in. wire to 1 $\frac{1}{2}$ in. pipe	$\frac{1}{4}$ in. wire to 2 in. pipe	$\frac{1}{4}$ in. wire to 2 $\frac{1}{2}$ in. pipe
Price, each . . . . .	\$3 00	4 00	6 00

## HERCULES ALL STEEL SCREW DRIVERS.



Length of Blade, ins.	1 $\frac{1}{2}$	2	3	4	5
Price per dozen . . .	\$3 00	3 00	3 00	3 00	3 50
Length of Blade, ins.	6	7	8	10	12
Price per dozen . . .	\$4 00	5 00	5 50	8 50	9 50

Bicycle Screw Driver, i. e. 1 $\frac{1}{2}$ -in. blade, is full polish—balance have japanned handle.

### DOUBLE-HEAD SET SCREW TOOL POST WRENCHES.



No.	Open End for Set Screw, Size	Closed End for Set Screw, Size	Length Over All	Price Un- finished	Price Fin- ished
201	$\frac{7}{16}$	$\frac{7}{16}$	$5\frac{1}{2}$	\$0 25	\$0 45
202	$\frac{1}{2}$	$\frac{1}{2}$	6	27	50
203	$\frac{9}{16}$	$\frac{9}{16}$	6	27	55
204	$\frac{5}{8}$	$\frac{5}{8}$	$6\frac{3}{4}$	32	60
205	$\frac{11}{16}$	$\frac{11}{16}$	$6\frac{3}{4}$	32	65
206	$\frac{3}{4}$	$\frac{3}{4}$	$7\frac{1}{2}$	40	70

The openings in above Wrenches will admit of finishing to a size larger than given in table.

### Single-Head Set Screw Wrenches.



No.	For Set Screws, Size	Ex-treme Length	Price Un- finished	Price Finished
280	$\frac{3}{16}$	3	\$0 08	\$0 16
281	$\frac{1}{4}$	$3\frac{3}{8}$	10 2	20
282	$\frac{5}{16}$	$4\frac{1}{2}$	12	24
283	$\frac{3}{8}$	$5\frac{1}{2}$	15	30
284	$\frac{7}{16}$	$6\frac{1}{4}$	20	40
285	$\frac{1}{2}$	7	25	50
286	$\frac{9}{16}$	$7\frac{1}{2}$	27	54
287	$\frac{5}{8}$	8	30	60
288	$\frac{3}{4}$	$9\frac{1}{4}$	35	70
289	$\frac{7}{8}$	$10\frac{1}{2}$	42	84
290	1	$11\frac{1}{2}$	50	1 00
291	$1\frac{1}{8}$	12	60	1 20

The openings in above Wrenches will admit of finishing to one or two sizes larger than given in table.

### DOUBLE-HEAD "S" WRENCH.



No.	Size of Opening	Thickness of Heads	Length Over All	Price Un- finished	Price Finished
220	$\frac{3}{8} \times \frac{7}{16}$	$\frac{1}{4}$	4	\$0 10	\$0 20
221	$\frac{1}{2} \times \frac{9}{16}$	$\frac{5}{16}$	5	15	30
222	$\frac{3}{4} \times \frac{1}{2}$	$\frac{3}{8}$	6	20	40
223	$\frac{7}{8} \times 1$	$\frac{7}{16}$	7	25	50
224	$1 \times 1\frac{1}{4}$	$\frac{1}{2}$	8	30	60
225	$1\frac{3}{8} \times 1\frac{1}{4}$	$\frac{9}{16}$	9	35	70

### "BULL-DOG" WRENCHES.



No. 0, Pocket size, 4 in. long, Price per doz., \$3 00

No. 1,  $5\frac{1}{4}$  in. long. . . . . Price per doz., 4 00



No. 1 $\frac{1}{2}$ ,  $5\frac{3}{4}$  inches long. . Price per dozen, \$5 00



No. 2, 9 inches long. . Price per dozen, \$12 00

No. 3, 16 inches long. . Price per dozen, 21 00

No. 4, 22 inches long. . Price per dozen, 36 00

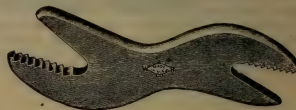
No. 4 $\frac{1}{2}$ , 24 inches long. . Price per dozen, 45 00

No. 5, 27 inches long. . Price per dozen, 54 00



Twin, 10 inches long. . . Price per dozen, \$18 00

### "ALWAYS READY" WRENCH.



Manufactured from special steel, forged and tempered in oil, polished and nickel-plated.

No. 1, 5 inches long . . . . . Price . . . . . per dozen, \$ 5 00

No. 2, 7 inches long . . . . . Price . . . . . per dozen, 6 75

No. 2 $\frac{1}{2}$ ,  $9\frac{1}{2}$  inches long . . . . . Price . . . . . per dozen, 10 50

No. 3,  $11\frac{1}{2}$  inches long . . . . . Price . . . . . per dozen, 16 00



## ENGINEERS' WRENCHES.

Double Head.



Drop Forged from Specially Selected Steel.

No.	Size Bolts, U. S. Stan'd Nuts.	Openings, Inches.	Ex- treme Length	Price Un- finis'd	Price Fin- ish'd
21	1/4 & 1/4	1 1/2 & 1 1/2	3 3/4	\$0 12	\$0 24
22	1/4 & 1/4	1 1/2 & 1 1/2	4	15	28
23	1/4 & 1/4	1 1/2 & 1 1/2	4 1/4	15	30
24	1/4 & 1/4	1 1/2 & 1 1/2	4 3/4	17	34
25	1/4 & 1/4	1 1/2 & 1 1/2	4 3/4	18	36
26	1/4 & 1/4	1 1/2 & 1 1/2	5 1/4	20	40
27	1/4 & 1/4	1 1/2 & 1 1/2	5 1/4	21	42
28	1/4 & 1/4	1 1/2 & 1 1/2	6 1/4	23	46
29	1/4 & 1/4	1 1/2 & 1 1/2	6 1/4	25	50
30	1/4 & 1/4	1 1/2 & 1 1/2	7 1/4	24	56
31	1/4 & 1/4	1 1/2 & 1 1/2	7 3/4	30	68
32	1/4 & 1/4	1 1/2 & 1 1/2	8 1/4	34	70
33	1/4 & 1/4	1 1/2 & 1 1/2	8 3/4	36	72
34	1/4 & 1/4	1 1/2 & 1 1/2	9 1/4	41	82
35	1/4 & 1/4	1 1/2 & 1 1/2	9 3/4	43	86
36	1/4 & 1/4	1 1/2 & 1 1/2	10 1/4	50	1 00
37	1/4 & 1/4	1 1/2 & 1 1/2	11 1/4	53	1 06
38	1/4 & 1/4	1 1/2 & 1 1/2	11 3/4	62	1 24
39	1/4 & 1/4	1 1/2 & 1 1/2	13 1/4	65	1 30
40	1/4 & 1/4	1 1/2 & 1 1/2	13 3/4	78	1 56
41	1/4 & 1/4	1 1/2 & 1 1/2	15 1/4	82	1 64
42	1/4 & 1/4	1 1/2 & 1 1/2	17 1/4	1 00	2 00
43	1/4 & 1/4	1 1/2 & 1 1/2	17 3/4	1 08	2 16
44	1/4 & 1/4	1 1/2 & 2	19 1/4	1 27	2 54
45	1/4 & 1/4	1 1/2 & 2	19 3/4	1 35	2 70
46	1/4 & 1/4	1 1/2 & 2	21 1/4	1 65	3 30
47	1/4 & 1/4	2 & 2 1/4	21 3/4	1 75	3 50
48	1/4 & 1/4	2 & 2 1/4	23 1/4	2 10	4 20
49	1/4 & 1/4	2 & 2 1/4	23 3/4	2 25	4 50
50	1/4 & 1/4	2 1/2 & 2 1/2	25 1/4	2 65	5 30
51	1/4 & 1/4	2 1/2 & 2 1/2	25 3/4	2 85	5 70
52	1/4 & 1/4	2 3/4 & 2 3/4	27 1/4	3 30	6 60
53	1/4 & 1/4	2 3/4 & 2 3/4	27 3/4	3 55	7 10
54	1/4 & 1/4	3 & 3 1/4	30 1/4	4 15	8 30
55	1/4 & 1/4	3 & 3 1/4	30 3/4	4 55	9 10
56	1/4 & 1/4	3 1/2 & 3 1/2	34 1/4	5 35	10 70
57	2 & 2 1/4	3 1/2 & 3 1/2	34 3/4	5 95	11 90

## Double-Head Set Screw Wrenches.



No.	For Set Screws Size.	Extreme Length.	Price Unfinished.	Price Finished.
65	1/4 & 1/4	3 3/4	\$0 13	\$0 26
66	1/4 & 1/4	3 3/4	13	26
67	1/4 & 1/4	4	15	30
68	1/4 & 1/4	4	15	30
69	1/4 & 1/4	5	18	36
70	1/4 & 1/4	5	18	36
71	1/4 & 1/4	5 1/4	22	44
72	1/4 & 1/4	5 1/4	22	44
73	1/4 & 1/4	6 1/4	27	54
74	1/4 & 1/4	6 1/4	27	54
75	1/4 & 1/4	7 1/4	33	66
76	1/4 & 1/4	7 1/4	33	66
77	1/4 & 1/4	8 1/4	40	80
78	1/4 & 1/4	8 1/4	40	80
79	1/4 & 1/4	10	48	96
80	1/4 & 1/4	10	48	96
81	1/4 & 1/4	11 1/4	58	1 18
82	1/4 & 1/4	11 1/4	58	1 16

## ENGINEERS' WRENCHES.

Single-Head.



No.	Size Bolts U S. St'd Nuts	Openings Inches.	Extreme Length.	Price Unfin'd.	Price Finished.
00	1/4	1 1/2	2 1/2	\$0 08	\$0 16
01	1/4	1 1/2	2 3/4	09	18
02	1/4	1 1/2	3 1/4	10	20
03	1/4	1 1/2	3 3/4	12	24
04	1/4	1 1/2	3 3/4	14	28
05	1/4	1 1/2	4 1/4	17	34
06	1/4	1 1/2	4 1/4	20	40
07	1/4	1 1/2	4 3/4	22	44
08	1/4	1 1/2	5 1/4	25	50
09	1/4	1 1/2	5 1/4	32	64
10	1/4	1 1/2	5 3/4	40	80
11	1/4	1 1/2	6 1/4	50	1 00
12	1/4	1 1/2	6 1/4	55	1 10
13	1/4	1 1/2	6 3/4	65	1 30
14	1/4	1 1/2	7 1/4	85	1 70
15	1/4	1 1/2	7 1/4	1 10	2 20
16	1/4	1 1/2	7 3/4	1 40	2 80
17	1/4	1 1/2	8 1/4	1 75	3 50
18	1/4	1 1/2	8 1/4	2 10	4 20
19	1/4	1 1/2	8 3/4	2 50	5 00
20	1/4	1 1/2	9 1/4	3 50	7 00
21	1/4	1 1/2	9 1/4	4 75	9 80

Furnished with regular thickness of heads.

## Double-Head Tool Post Wrenches.



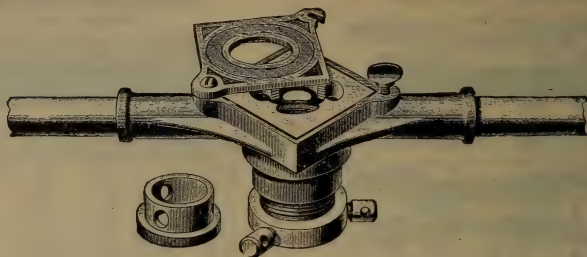
No.	Open End for U. S. Standard Nuts.	Closed End for Set Screw. Size.	Length over all.	Price Un- finis'd.	Price Finis'd.
121	3/4	1 1/2	6 1/2	\$0 30	\$0 50
129	1/2	1 1/2	7	35	60
131	1/2	1 1/2	7	35	60
132	1/2	1 1/2	7	35	60
139	5/8	3/4	7 1/2	40	70
140	5/8	3/4	8	45	80
143	3/4	3/4	9	55	1 00

## Single-Head Box Wrenches.



No.	For Set Screw Size.	Length over all.	Thick- ness of Head.	Price Un- finis'd.	Price Finished.
250	1/4	3 3/8	9/16	\$0 10	\$0 20
251	1/4	3 1/4	1 1/8	11	22
252	1/4	4 1/4	1 1/8	13	26
253	1/4	4 3/8	1 1/8	16	32
254	1/2	5 1/2	1 1/2	19	38
255	1/2	6 1/4	1 1/2	22	44
256	3/4	7	1 3/4	26	52
257	3/4	8	1 3/4	30	60
258	1	9	1 3/4	36	72
259	1 1/8	10	1 3/4	44	88

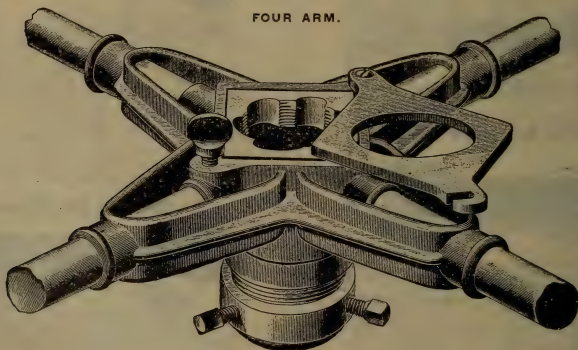
## STOCKS AND DIES.



Number	Threads Pipe, Inches	Dimensions of Dies	Stock and Dies, Complete	Stock only, without Dies	Extra Dies	Extra Bushings	Die Frames
0	$\frac{1}{8}$ to $\frac{1}{2}$	2 x $\frac{1}{2}$	9.50	3.50	1.50	.25	
1	$\frac{1}{4}$ to 1	2 $\frac{1}{2}$ x $\frac{3}{4}$	15.00	5.00	2.00	.35	.30
1 $\frac{1}{2}$	$\frac{3}{4}$ to 1 $\frac{1}{4}$	3 x $\frac{3}{4}$	13.50	6.00	2.50	.45	.40
1 $\frac{3}{4}$	1 to 1 $\frac{1}{2}$	3 x $\frac{3}{4}$	13.50	6.00	2.50	.45	.40
2	1 $\frac{1}{4}$ to 2	4 x $\frac{7}{8}$	20.00	9.50	3.50	.60	.50
3	2 $\frac{1}{2}$ and 3	5 x 1 $\frac{3}{4}$	43.00	25.00	9.00	1.00	.60

Numbers 2 and 3 Stocks have Leader Screws.

## FOUR ARM.



Number	Threads Pipe, Inches	Dimensions of Dies	Stock and Dies, Complete	Stock only, without Dies	Extra Dies	Extra Bushings	Die Frames
4	2 $\frac{1}{2}$ and 3	5 x 1 $\frac{3}{4}$	51.00	33.00	9.00	1.00	.60

# ARMSTRONG ADJUSTABLE STOCKS AND DIES.



## No. 1 STOCK WITH

- 4 R. H. Pipe Dies,  $\frac{1}{8}$  to  $\frac{1}{2}$  each, \$9.00
- 4 Each, R. and L. Pipe Dies,  
 $\frac{1}{8}$  to  $\frac{1}{2}$  each, . . . . . 14.00
- 7 Bolt Dies,  $\frac{1}{4}$  to  $\frac{3}{4}$  . . . . . 15.00
- 4 Pipe and 7 Bolt Dies, . . . . . 20.00
- 7 Bolt Dies, 7 Taps  $\frac{1}{4}$  to  $\frac{3}{4}$  . . 20.00
- 4 Pipe Dies, 7 Bolt Dies, 7  
Taps, . . . . . 24.80

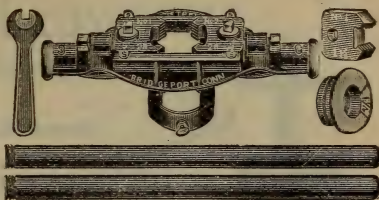
### Sizes Furnished in Bolt Dies.

$\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{7}{16}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ ,  
other sizes Special.

This Stock will not take Bolt sizes smaller than  $\frac{1}{4}$ , nor larger than  $\frac{3}{4}$ .

## No. 2 STOCK WITH

- 5 Pipe Dies,  $\frac{1}{4}$  to 1, . . . . . \$12.00
- 6 Pipe Dies,  $\frac{1}{8}$  to 1, . . . . . 14.00
- 5 Pipe Dies, Right and Left,  
 $\frac{1}{4}$  to 1, . . . . . 20.00
- 6 Pipe Dies, Right and Left,  
 $\frac{1}{8}$  to 1, . . . . . 23.00
- 7 Bolt Dies,  $\frac{1}{2}$  to  $1\frac{1}{4}$ , . . . . . 20.00
- 7 Bolt  $\frac{1}{2}$  to  $1\frac{1}{4}$ , and 5 Pipe  
Dies  $\frac{1}{4}$  to 1, . . . . . 28.50
- 7 Bolt Dies, 7 Taps  $\frac{1}{2}$  to  $1\frac{1}{4}$ , . 30.00
- 7 Bolt Dies, 7 Taps  $\frac{1}{2}$  to  $1\frac{1}{4}$   
and 5 Pipe Dies,  $\frac{1}{4}$  to 1, . . 38.75



## No. 2½ STOCK WITH

- 4 Dies, cutting  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1, and  
 $1\frac{1}{4}$ , Right Hand, . . . . . \$12.00
- Dies cutting  $\frac{1}{2}$  to  $1\frac{1}{4}$  R. and L. 18.00
- Pipe Dies, single end,  $\frac{1}{4}$  or  $\frac{3}{8}$  . 3.00

## No. 3 STOCK WITH

- 3 Sizes Pipe Dies,  $1\frac{1}{4}$  to 2, R. H. 20.00
- 4 " " " 1 to 2, R. H. 24.00
- 5 " " "  $\frac{3}{4}$  to 2, R. H. 28.50
- 3 " " "  $1\frac{1}{4}$  to 2 Right  
and Left, . . . . . 32.00
- 4 Sizes Pipe Dies, 1 to 2 Right  
and Left, . . . . . 40.00
- 5 Sizes Pipe Dies,  $\frac{3}{4}$  to 2, Right  
and Left, . . . . . 48.50

## No. 6 STOCK WITH

- Die cutting  $2\frac{1}{2} \times 3$ , Right, . . 40.00
- " "  $2\frac{1}{2} \times 3$ , R. and L. . 55.00

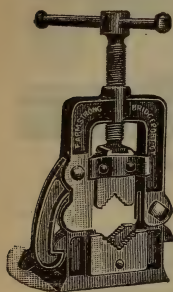
The change from  $2\frac{1}{2}$  to 3, is made by reversing Dies end for end, when they will cut 2 standard sizes without further adjustment.

## No. 7 STOCK WITH

- Dies cutting  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$  and 4 R. 60.00
- " "  $2\frac{1}{2}$  and 3, " . . 45.00
- " "  $3\frac{1}{2}$  " 4, " . . 45.00
- " "  $2\frac{1}{2}$  to 4, R. and L. 92.00
- " "  $2\frac{1}{2}$ , 3 or  $3\frac{1}{2}$  and 4,  
Right and Left, . . . . . 60.00

These Dies come in Sets of four pieces, each piece being Double ended.

## ARMSTRONG HINGED VISES.



- No. 1 will hold from 0 to  $2\frac{1}{2}$  Pipe, . . . . . \$10.00  
 No. 2 „ „ „  $\frac{1}{2}$  to  $4\frac{1}{2}$  „ . . . . . 20.00

### Brass Pipe Jaws No. 1 Hinge Vise.

- {  $\frac{5}{8}$ ,  $\frac{3}{4}$  or  $\frac{7}{8}$  O. Dia., } . . . . . 75  
 {  $\frac{1}{8}$ ,  $\frac{1}{4}$  or  $\frac{3}{8}$  I. P. Size, } . . . . .  
 1,  $1\frac{1}{8}$  or  $1\frac{1}{4}$  O. Dia., . . . . . 1.00  
 {  $1\frac{3}{8}$ ,  $1\frac{1}{2}$  or  $1\frac{5}{8}$  O. Dia., } . . . . . 1.25  
 {  $\frac{1}{2}$ ,  $\frac{3}{4}$  or 1 I. P. Size, } . . . . .  
 $1\frac{3}{4}$ ,  $1\frac{7}{8}$  or 2 O. Dia., . . . . . 1.50  
 {  $2\frac{1}{8}$ ,  $2\frac{1}{4}$  or  $2\frac{3}{8}$  O. Dia., } . . . . . 1.75  
 {  $1\frac{1}{4}$ ,  $1\frac{1}{2}$  or 2 I. P. Size, } . . . . .

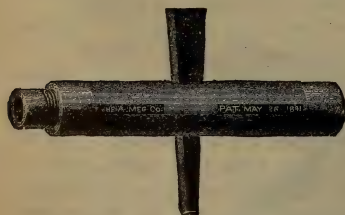
### PIPE WRENCH.

- No. 3 Takes from 0 to 1 . . \$2.00  
 No. 4 „ „ 0 to  $1\frac{1}{2}$  . 2.75  
 No. 5 „ „  $\frac{3}{8}$  to  $2\frac{1}{2}$  . 4.50  
 No. 6 „ „ 1 to 4 . 12.00



### NIPPLE HOLDER FOR STOCKS.

- For No. 2 Stock  $\frac{3}{8} \times \frac{1}{2}$  or  $\frac{3}{4} \times 1$  each, \$3.00  
 „ „  $2\frac{1}{2}$  „  $\frac{1}{2} \times \frac{3}{4}$  or  $1 \times 1\frac{1}{4}$  „ . 3.00  
 „ „ 3 „  $1 \times 1\frac{1}{4}$  or  $1\frac{1}{2} \times 2$  „ . 3.50  
 „ „ 6 „  $2\frac{1}{2} \times 3$  „ . 8.00  
 „ „ 7 „  $2\frac{1}{2} \times 3$  or  $3\frac{1}{2} \times 4$  „ . 8.00



### BARD ADJUSTABLE BUSHINGS,

To take the place of ordinary Ring Bushings.

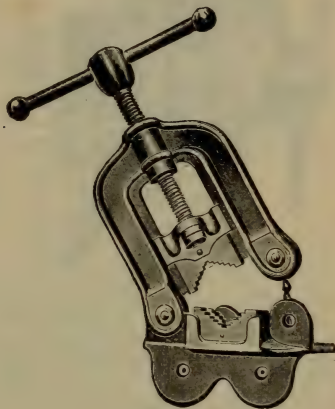
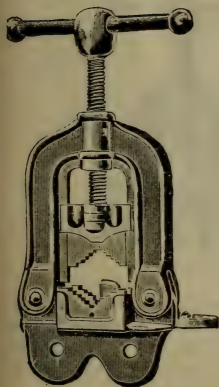
- No. 1 For Stocks threading Pipe  $\frac{1}{2}$  in. down each, . \$4.50  
 No. 2 „ „ „ „ 1 „ „ „ . 5.00  
 No.  $2\frac{1}{2}$  „ „ „ „  $1\frac{1}{4}$  „ „ „ . 6.00  
 No. 3 „ „ „ „ 2 „ „ „ . 8.00  
 No. 3 with Leader Screw, . . . . . 10.00



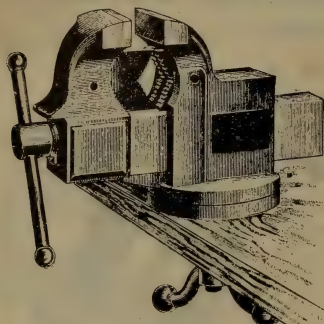


**BARRETT'S OPEN HINGED MALLEABLE PIPE VISE.**

STEEL JAWS, STEEL SCRWS.



No.	Takes Pipe.	Weight.	Price.
1	$\frac{1}{8}$ to 2 in.	23 lbs.	\$10.00
2	$\frac{1}{8}$ to 3 "	26 "	14.00

**COMBINATION PIPE VISE.**

No.	Width Jaw	Weight	Holding Pipe.	Base	List Price
100	3½ in	50 lbs.	½ to 2 in.	Swivel	\$16 00
105	4 "	65 "	½ to 3 in	Swivel	20 00
110	5 "	116 "	½ to 4 in	Stationary	28 00

Our Vises are made of the best grade of iron, with steel jaws firmly welded and carefully tempered. The pipe jaws are made of the finest cast steel, and are cut from solid bars.

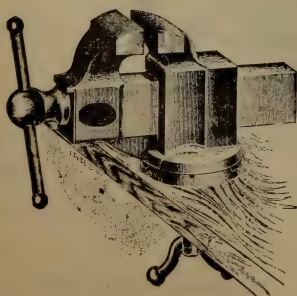
These Vises are strong in all their parts, and for workmanship, durability and convenience they are the best vise on the market.

**KEYSTONE  
MALLEABLE PIPE VISE.**

Patented.

No. R, holding Pipe	½ to 2 in.	\$ 4 00
No. S, " "	½ to 4 in.	10 00
No. T, " "	2 to 6 in.	16 00
No. U, " "	6 to 12 in.	50 00

Equipped with Roller Jaws which are a sure grip — will not mar the pipe and will outlast three or four sets of V Jaws.

**MACHINISTS' VISE.****SWIVEL BASE.**

No.	Width Jaw	Opens.	Weight.	List Price.
8	2 inches.	3 inches.	8 lbs.	\$ 4 30
8½	2½ "	3½ "	16 "	5 20
10	3½ "	4 "	30 "	7 50
20	3½ "	5 "	35 "	8 75
30	4 "	6 "	56 "	11 00
40	4½ "	7 "	71 "	12 50
50	5 "	8 "	91 "	16 00
60	6 "	9 "	157 "	30 00
70	7 "	11 "	220 "	33 00

All Our Swivel Vises are Equipped with Hough's Improved Swivel Base.

## Swivel Jaw MACHINISTS' VISE.

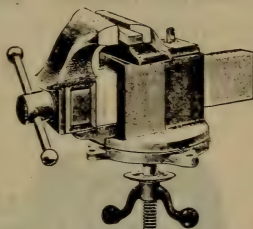
### STATIONARY BASE.



No.	Width Jaw	Opens	Weight	Each
315	3½ in.	5 in.	32 lbs.	\$ 7 00
325	4 "	6 "	48 "	9 00
345	5 "	8 "	75 "	15 00
355	6 "	9 "	145 "	24 00

## Swivel Jaw MACHINISTS' VISE.

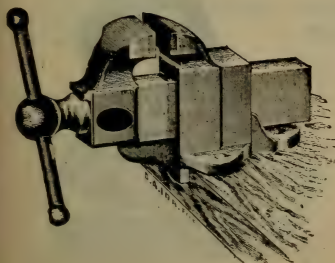
### SWIVEL BASE.



No.	Width Jaw	Opens	Weight	Each
320	3½ in.	5 in.	38 lbs.	\$ 8 50
330	4 "	6 "	60 "	10 50
350	5 "	8 "	95 "	17 00
360	6 "	9 "	162 "	27 00

## MACHINISTS' VISE.

### STATIONARY BASE.



Extra Strength and Well Finished.

No.	Width Jaw.	Opens.	Weight.	List Price.
3	2 inches.	3 inches.	6 lbs.	\$ 3 80
3½	2½ "	3½ "	13 "	4 75
5	3½ "	4 "	27 "	6 00
15	3½ "	5 "	30 "	7 00
25	4 "	6 "	45 "	9 00
35	4½ "	7 "	60 "	10 00
45	5 "	8 "	70 "	13 00
55	6 "	9 "	137 "	25 00
59	7 "	11 "	195 "	28 50

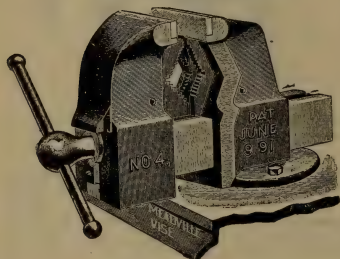
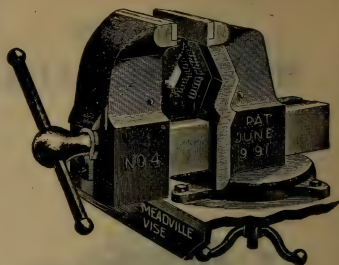
## BARRETT'S PATENT STEEL BAR COMBINATION PIPE VISE.

SWIVEL BOTTOM.

**Strongest and Best Vise on the Market.**

Guaranteed not to Break.

No.	Jaws Open	Takes Pipe.	Weight.	Price.
3½	5 in.	¼ to 4 in.	118 lbs.	\$32.00
4½	6 "	⅜ to 6 "	158 "	40.00



## BARRETT'S PATENT STEEL BAR COMBINATION PIPE VISE.

STATIONARY BOTTOM.

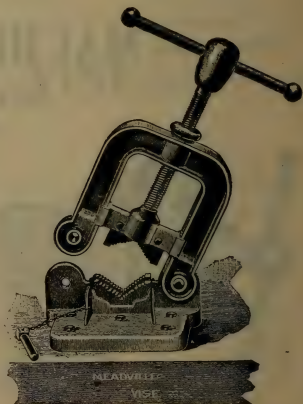
No.	Jaws Open	Takes Pipe.	Weight.	Price.
3	5 in.	¼ to 4 in.	105 lbs.	\$23.00
4	6 "	⅜ to 6 "	145 "	35.00

## BARRETT'S OPEN HINGED MAL- LEABLE VISE.

STEEL JAWS, STEEL SCREWS.

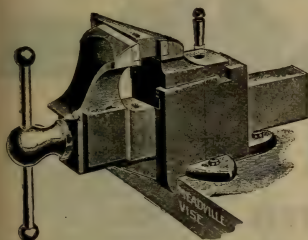
We aim to make a vise that is superior to any other on the market; not clumsy, is well proportioned. We will, without cost, replace any defective parts.

No.	Takes Pipe.	Weight.	Price.
3	⅛ to 4 in.	48 lbs.	\$28.00
4	⅛ to 6 "	74 "	35.00





## MACHINISTS' SELF-ADJUSTING JAW VISE. STATIONARY BOTTOM.

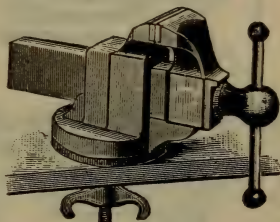


No.	Width of Jaw.	Jaws Open.	Weight.	Price.
67	3½ in.	4¾ in.	28 lbs.	\$ 7 00
68	4 " "	5¼ " "	41 " "	9 00
69	4½ " "	6 " "	54 " "	10 50
71	5¼ " "	8 " "	96 " "	17 00
72	6 " "	9 " "	156 " "	21 00
72½	7 " "	11 " "	184 " "	30 00

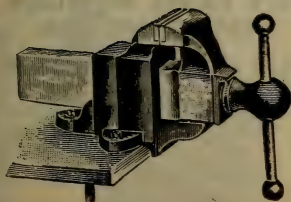
## BARRETT'S SOLID JAW PARALLEL VISES.

Machinists' Solid Jaw, Swivel Bottom,  
Parallel Vise.

No.	Width of Jaw.	Jaws Open.	Weight.	Price.
303¾	3¼ in.	4 in.	28 lbs.	\$ 7 50
303½	3⅝ " "	5 " "	36 " "	8 75
314	4⅞ " "	5½ " "	52 " "	10 50
304½	4⅞ " "	6¼ " "	64 " "	12 50
305	5 " "	7 " "	85 " "	16 00
305½	5½ " "	8½ " "	115 " "	22 00
306	6 " "	9½ " "	155 " "	30 00



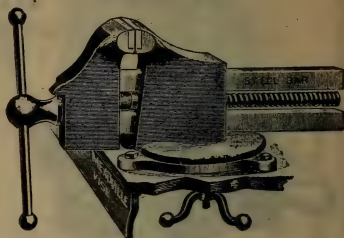
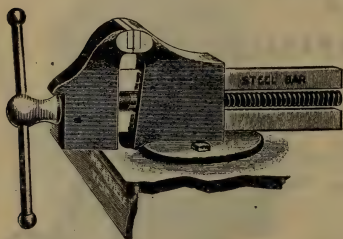
Machinists' Solid Jaw Stationary Bottom,  
Parallel Vise.



No.	Width of Jaw.	Jaws Open.	Weight.	Price.
403¾	3¼ in.	4 in.	22 lbs.	\$ 6 00
4¾	3⅝ " "	5 " "	28 " "	7 00
404	4 " "	5½ " "	42 " "	8 50
404½	4⅞ " "	6¼ " "	52 " "	10 00
405	5 " "	7 " "	72 " "	13 00
405½	5½ " "	8½ " "	100 " "	18 50
406	6 " "	9½ " "	135 " "	25 00
308½	8½ " "	12 " "	275 " "	50 00

**BARRETT'S STEEL BAR SWIVEL BOTTOM VISE.**

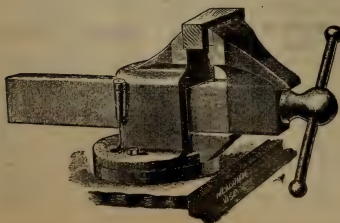
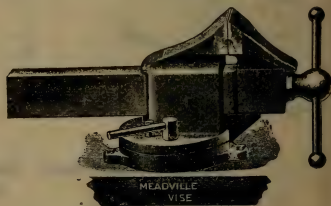
No.	Width of Jaw.	Jaws Open.	Weight.	Price.
53	3 $\frac{3}{4}$ in.	5 $\frac{1}{4}$ in.	41 $\frac{1}{2}$ lbs.	\$ 8 50
54	4 $\frac{1}{4}$ "	6 "	54 $\frac{1}{2}$ "	11.00
56	4 $\frac{3}{4}$ "	7 "	81 "	12.50
57	5 "	8 "	95 "	16.00
58	5 $\frac{1}{4}$ "	8 "	100 "	19.00
59	6 "	9 $\frac{1}{2}$ "	118 $\frac{1}{2}$ "	27.00
62	7 $\frac{1}{4}$ "	9 $\frac{1}{2}$ "	150 "	30.00
66	8 "	.....	.....	55.00

**BARRETT'S SOLID JAW STEEL BAR VISE.**

No.	Width of Jaw.	Jaws Open.	Weight.	Price.
41	3 $\frac{3}{4}$ in.	5 $\frac{1}{4}$ in.	37 lbs.	\$ 7.00
42	4 $\frac{1}{4}$ "	6 "	47 "	9.00
43	4 $\frac{3}{4}$ "	7 "	71 "	10.50
44	5 "	8 "	83 "	13.00
46	5 $\frac{1}{4}$ "	8 "	92 "	17.00
47	6 "	9 $\frac{1}{2}$ "	110 "	24.00
48	6 $\frac{1}{4}$ "	9 $\frac{1}{2}$ "	115 "	27.00
52	8 "	.....	.....	50.00

**Barrett's Patent Adjustable Jaw Woodworkers' Vise.**  
**WITH SWIVEL BOTTOM,**

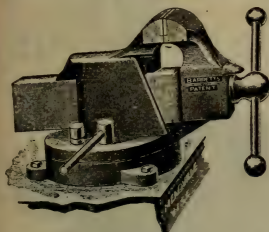
No.	Width of Jaw.	Jaws Open.	Weight.	Price.
118	4 $\frac{5}{8}$ in.	9 $\frac{1}{2}$ in.	70 lbs.	\$13.00

**Barrett's Patent Adjustable Jaw Coachmakers' Vise.**  
**WITH STATIONARY BOTTOM.**

No.	Width of Jaw.	Jaws Open.	Weight.	Price.
114	4 $\frac{5}{8}$ in.	9 $\frac{1}{2}$ in.	65 lbs.	\$11.00

## BARRETT'S ADJUSTABLE JAW MACHINISTS' VISE.

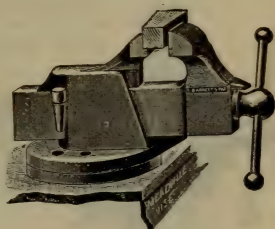
Barrett's Patent Swivel Bottom permits the vise to be instantly adjusted to the right or left at any angle at will of operator. Being quickly fastened by a friction plate, the vise is rendered as solid and firm as if stationary, at any desired angle.



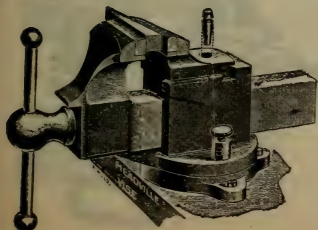
No.	Width of Jaw.	Weight.	Jaws Open.	Price.
10	3 in.	24 lbs.	4 in.	\$ 7.75
20	3½ "	37½ "	5 "	8.50
30	4½ "	58½ "	6 "	11.00
40	4¾ "	72 "	7 "	12.50
50	5 "	105 "	8 "	17.75
60	5¼ "	110 "	8½ "	19.00
70	6 "	165 "	9 "	27.00
80	6¼ "	175 "	9½ "	30.00

## ADJUSTABLE JAW WITH STATIONARY BOTTOM.

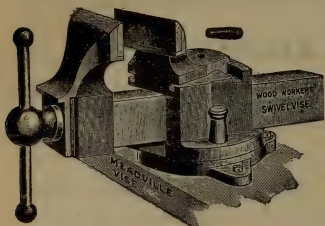
No.	Width of Jaw.	Weight.	Jaws Open.	Price.
5	3 in.	20 lbs.	4 in.	\$ 6.25
15	3½ "	35 "	5 "	7.00
25	4½ "	55 "	6 "	9.00
35	4¾ "	65 "	7 "	10.50
45	5 "	94 "	8 "	15.50
55	5¼ "	97 "	8½ "	17.00
65	6 "	150 "	9 "	24.00
75	6¼ "	160 "	9½ "	27.00



## MACHINIST'S SELF-ADJUSTING JAW VISE. SWIVEL BOTTOM.



No.	Width of Jaw.	Jaws Open.	Weight.	Price.
73	3½ in.	4¾ in.	32 lbs.	\$ 8.50
74	4 "	5¼ "	46 "	10.50
76	4½ "	6 "	65 "	12.50
77	5¼ "	8 "	109 "	19.00
78	5¾ "	9 "	168 "	27.00
78½	6 "	11 "	207 "	35.00

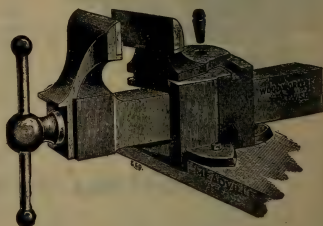


## COACHMAKER'S OR WOODWORKERS' VISES.

No.	Width of Jaw.	Jaws Open.	Weight.	Price.
11	3½ in.	7 in.	34 lbs.	\$ 9.50
12	4½ " "	9½ " "	67 " "	13.00

## COACHMAKER'S OR WOODWORKER'S VISES.

No.	Width of Jaw.	Jaws Open.	Weight.	Price.
11½	3½ in.	7 in.	30 lbs.	\$ 8.00
12½	4½ " "	9½ " "	59 " "	11.00



## BARRETT'S STEEL BAR WOODWORKERS' VISE.

SWIVEL OR STATIONARY BOTTOM.

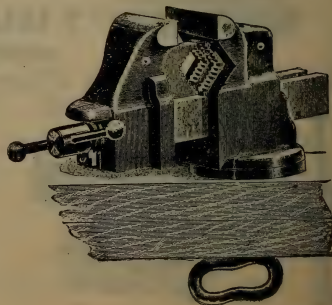
No.	Width of Jaw.	Jaws Open.	Weight.	Price.
Flat Base. 6	4½ in.	9 in.	50 lbs.	\$10.50
Swivel Base 7	4⅝ " "	9 " "	58 " "	12.50

## BARRETT'S PATENT STEEL BAR COMBINATION PIPE VISE.

Guaranteed not to Break.

STRONGEST AND BEST VISE ON THE MARKET.

No.	Width of Jaw.	Holds Pipe.	Weight.	Price.
1	4¼ in.	¼ to 2 in.	47½ lbs.	\$16.00
2	4⅝ " "	¼ to 3 " "	56 " "	20.00





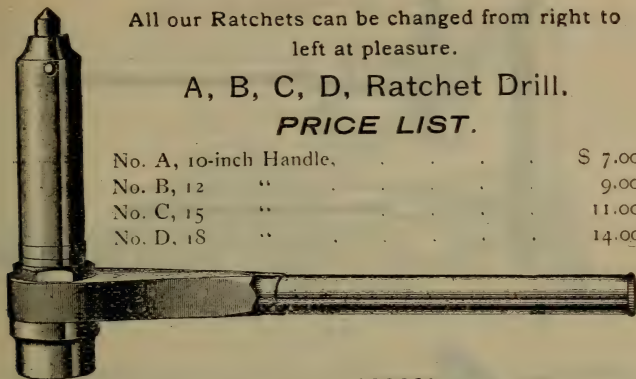
## RATCHET DRILLS.

All our Ratchets can be changed from right to left at pleasure.

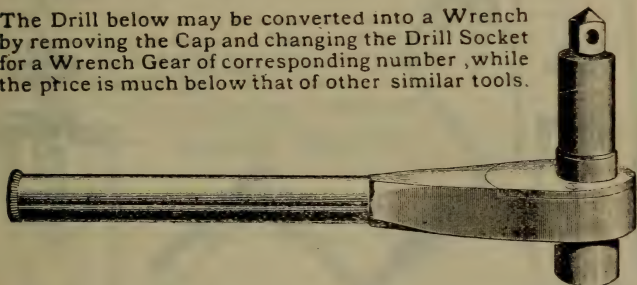
A, B, C, D, Ratchet Drill.

### PRICE LIST.

No. A, 10-inch Handle,	\$ 7.00
No. B, 12        "	9.00
No. C, 15       "	11.00
No. D, 18       "	14.00



The Drill below may be converted into a Wrench by removing the Cap and changing the Drill Socket for a Wrench Gear of corresponding number, while the price is much below that of other similar tools.



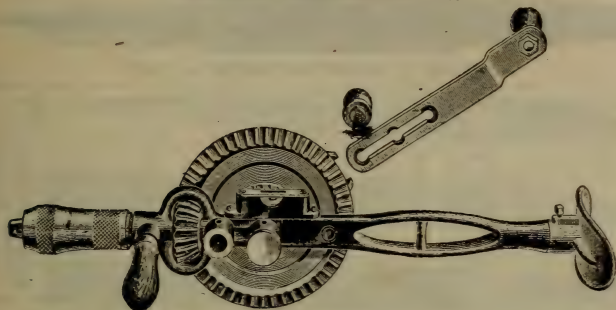
### PRICE LIST.

No. 1, 10-inch Handle,	\$ 6.00
No. 2, 12        "	8.00
No. 3, 15       "	10.00
No. 4, 18       "	12.00

### BOILER RATCHETS.

No. 1, 10-inch Handle,	\$ 6.00
No. 2, 12        "	8.00
No. 3, 15       "	10.00

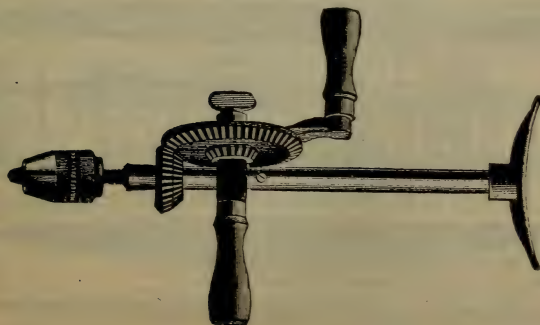


**BREAST DRILL, No. 12.****BALL BEARING**

Changeable gear from even, to speeded about 3 to 1.

This drill has been greatly improved recently. As now made the drive wheel is 5 inches in diameter. The gears are cut from solid metal, and run almost absolutely perfect. A roller is placed at back of drive gear, which makes it equally as firm and substantial as a double geared drill. The Crank is adjustable to three different lengths, and is held in place by a round head thumb screw with milled edges, which gives the drill an attractive appearance. The drive gear is held by a similar screw. The chuck is nicked and has our new Alligator jaws suitable for both round and square shanks. They hold from 5-64 up. The handles are Cocobola. A new feature possessed by no other Drill than those made by ourselves is the level attachment which enables the operator to see when the drill is being held true, and will be appreciated by good mechanics. Everything about the tool will be found durable and nicely finished.

Price.....per dozen, \$30 00

**BREAST DRILL, No. 11.**

No. 11 Drill is same in finish as No. 10, but the chuck is arranged with three

## WARRANTED FILES.



## PRICE LIST IN EFFECT NOVEMBER 1st, 1899.

INCH	MILL AND ROUND			FLAT			INCH	SQUARE			HAND AND PILLAR			INCH	HIL. R. & Three Sq.			WARDING		
	Bas'd	2d Cut	Sm'th	Bas'd	2d Cut	Sm'th		Bas'd	2d Cut	Sm'th	Bas'd	2d Cut	Sm'th		Bas'd	2d Cut	Sm'th	Bas'd	2d Cut	Sm'th
4	3 00	3 50	3 90	3 70	4 20	4 70	4	3 80	4 60	4 90	3 70	4 30	4 80	4	4 80	5 60	6 10	4 00	4 80	5 40
5	3 20	3 80	4 10	3 90	4 60	4 90	5	4 10	4 80	5 30	3 90	4 70	5 30	5	5 40	6 10	6 40	4 50	5 30	5 80
6	3 50	4 00	4 50	4 30	4 80	5 30	6	4 60	5 10	5 50	4 30	5 10	5 60	6	6 10	6 70	7 10	4 90	5 90	6 40
7	3 90	4 60	4 90	4 50	5 50	6 10	7	5 10	5 80	6 30	4 90	5 80	6 30	7	7 00	7 70	8 20	5 60	6 90	7 50
8	4 30	4 90	5 40	5 30	6 10	6 70	8	5 50	6 30	7 00	5 40	6 30	7 00	8	7 50	8 30	8 90	6 40	7 50	8 20
9	4 80	5 80	6 30	6 30	7 20	7 90	9	6 60	7 70	8 30	6 70	7 80	8 30	9	8 50	9 40	9 90	7 80	9 00	9 50
10	5 60	6 40	7 00	7 00	8 10	8 70	10	7 40	8 50	9 10	7 50	8 70	9 40	10	9 10	10 10	10 70	8 70	10 10	11 00
11	6 70	7 80	8 50	8 60	9 80	10 70	11	9 10	10 40	11 30	9 40	10 90	11 80	11	10 70	11 80	12 70	10 90	12 70	13 70
12	7 50	8 60	9 40	9 70	11 00	12 10	12	10 20	11 50	12 80	10 70	12 30	13 50	12	11 80	13 00	14 10	12 90	14 30	15 40
13	9 40	10 70	11 70	11 90	13 60	14 70	13	12 50	14 30	15 40	13 30	15 20	16 20	13	14 10	15 40	16 60	15 20	17 40	18 70
14	10 70	12 10	13 10	13 30	15 30	16 70	14	13 90	16 10	17 50	15 10	17 00	18 20	14	15 50	17 10	18 70	17 00	19 40	21 00
15	13 10	15 00	16 10	16 30	18 60	20 20	15	16 90	19 20	20 90	17 90	20 20	22 10	15	18 50	20 20	22 10			
16	14 70	16 80	17 90	18 20	20 60	22 30	16	18 70	21 20	23 00	20 20	22 80	24 20	16	20 00	22 50	24 20	STAVESAW		
17	18 20	20 20	21 70	21 90	24 60	26 50	17	22 50	25 20	27 10	24 20	27 20	29 60	17	24 70	27 20	29 60	8 inch, \$9 40		
18	20 20	22 20	23 70	23 90	26 80	28 90	18	25 10	28 00	30 40	26 80	29 90	32 10	18	27 50	30 40	32 10			
19	24 60	27 50	29 20	29 40	32 60	34 90	19	29 30	32 30	34 70	31 90	35 30	37 60	19	32 80	35 80	37 60	STAVESAW IMP'D.		
20	27 40	30 70	32 30	32 50	36 30	38 90	20	32 80	36 30	38 90	35 10	39 30	41 60	20	36 20	39 40	41 60	6 inch, \$6 40		

MILL BLUNT, Double Cut,  
advance 2 in.  
MILL DOUBLE CUT,  
advance 1 in.  
MILL NARROW POINT,  
advance 1 in.

CANT (BLUNT)  
Double Cut  
advance 2 in.

Square BLUNT  
advance 1 in.

Slotted (BLUNT)  
advance 2 in.  
Cotter BLUNT or  
Taper  
advance 2 in.

Ginsaw, take Bastard Price  
Crossing, . . . adv. 2 in.  
Tumbler, . . . . . 2  
Feather Edge (BLUNT), 2  
High Back, . . . . . 2  
Half Round, . . . . . 2

INCH	MILL ONE ROUND EDGE			MILL TWO R. EDGES			INCH	TAPERS		SLIM TAPERS		BLUNT'S & Tap'r		INCH	PIT SAW		CROSS CUT		HOOK TOOTH		PLA' KNIFE		Jaw'd Tooth or Chisel Tooth	
	Bas'd	2d Cut	Sm'th	Bas'd	2d Cut	Sm'th		Single Cut	D'ble Cut	Single Cut	D'ble Cut	Regu- lar	Slim		Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut	Single Cut
4	3 40	3 90	4 40	3 80	4 40	4 90	4	2 10	2 50	2 10	2 50	2 50	2 50	4	4 80	4 30	4 80							
5	3 60	4 30	4 60	4 00	4 80	5 10	5	2 10	2 50	2 10	2 50	2 50	2 50	5	5 40	4 70	5 40							
6	3 90	4 50	5 10	4 40	5 00	5 60	6	2 20	2 90	2 20	2 90	2 90	2 60	6	6 10	5 40	6 10	6 70						
7	4 40	5 20	5 50	4 90	5 80	6 10	7	2 40	3 10	2 30	3 00	3 10	3 00	7	7 00	6 10	7 00	7 70						
8	4 80	5 50	6 10	5 40	6 10	6 80	8	2 60	3 50	2 50	3 20	3 50	3 20	8	7 50	6 40	7 50	8 30	6 40	8 30				
9	5 50	6 50	7 10	6 10	7 30	7 90	9	3 00	4 00	2 90	3 50	4 00	3 50	9	8 50	7 80	8 50	9 40						
10	6 30	7 20	7 90	7 10	8 00	8 80	10	3 40	4 70	3 30	4 70	5 30	4 90	10	9 10	8 70	9 10	10 10	8 60	10 10				
11	7 50	8 80	9 60	8 40	9 80	10 60	11	4 30	5 60	3 80	4 50	5 60	4 50	11	10 70	10 10	10 70	11 10						
12	8 40	9 70	10 60	9 40	10 80	11 80	12	5 40	6 70	4 50	5 30	6 70	5 30	12	11 80	11 40	11 80	12 10						
13	10 60	12 00	13 20	11 80	13 40	14 60	13	6 60	8 10	5 40	6 30	8 10	6 30	13										
14	12 00	13 70	15 10	13 40	15 30	16 70	14	8 10	9 70	6 40	7 10	9 70	7 50	14										
15	14 70	16 60	18 10	16 40	18 60	20 10	15	10 70	12 10	8 30	9 10	12 10	10 70	15										
16	16 50	18 90	20 10	18 40	21 00	22 40	16	12 50	14 70	9 50	11 00	14 70	12 10	16										
17	20 50	22 70	24 40	22 80	25 30	27 20	17	15 90	17 50	12 10	13 10	17 50	15 10	17										
18	22 70	25 20	27 30	25 30	28 20	30 40	18	18 20	20 60	13 80	15 40	20 60	18 10	18										

Climax, adv. 2 in. on Hil. Rd. Bastard.  
Round Culling, take Pit Saw Price.

DOUBLE-ENDED TAPER.				
6	7	8	9	10
3 50	3 50	3 90	4 40	4 90

INCH	HORSE RASPS		FILE RASPS		INCH	WOOD FILES		WOOD RASPS		INCH	SHOE RASPS		KNIFE	
	Plain & 3-1/2	Tag'd	Flat	Hil. R.		Flat	Hil. R.	Flat	Hil. R.		Flat	Hil. R.	Flat	Hil. R.
6	...	...	7 40	8 10	6	4 30	6 10	7 40	8 10	6	8 10	8 10	4	5 40
7	...	...	8 60	9 30	7	4 80	7 00	8 60	9 30	7	9 30	9 30	5	6 10
8	...	...	9 40	10 10	8	5 30	7 50	9 40	10 10	8	10 10	10 10	6	6 90
9	...	...	11 40	12 20	9	6 30	8 50	11 40	12 20	9	12 20	12 20	7	7 80
10	9 40	10 10	12 80	13 60	10	7 00	9 10	12 80	13 60	10	13 70	13 70	8	8 50
11	11 40	12 10	15 10	16 10	11	8 60	10 40	15 10	16 10	11	16 80	16 80	9	9 40
12	12 80	14 40	17 60	18 60	12	9 70	11 80	17 60	18 60	12	18 70	18 70	10	10 10
13	15 20	17 00	20 60	22 20	13	11 80	14 20	20 60	22 20	13	22 40	22 40	11	12 20
14	17 80	20 20	23 80	25 40	14	13 30	15 70	23 80	25 40	14	24 80	24 80	12	13 70
15	20 90	23 30	27 30	29 90	15	16 00	18 50	27 30	29 90	15			13	16 30
16	24 00	26 40	30 40	33 00	16	17 80	20 80	30 40	33 00	16			14	18 20
17	28 90	31 30	35 30	37 90	17	21 50	24 50	35 30	37 90	17				
18	32 90	35 30	39 30	41 90	18	23 90	26 90	39 30	41 90	18				

LAST MAKERS' RASPS.  
1 in. adv. on Cab. Rasp

Sizes below 4 inches, not extended, take 4 inch price.

Half Inches not specified, take next higher full inch price.

Dead Smooth, double the price of Bastard Cut.

One Round Edge, advance 12 1/2 per cent.

All Lengths above those listed, advance 25 per cent. on next lower inch price.

Blunt Files not specified, advance one inch on respective kinds and cuts.

Single or Float Cut not specified, on regular shapes take Double Cut price.

Equalings (Bellied), advance two inches on respective kinds and cuts.

Two Round Edges, advance 25 per cent.

Files Varying from standard sizes, subject to special prices.

Cuts not Specified, made upon regular blanks, advance one inch on respective kinds and nearest cut.





Representing a 3" Hand File.



Representing a 3" Warding File.



Representing a 3 1/2" Equalling File.



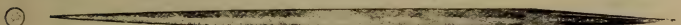
Representing a 3" Pillar File.



Representing a 3 1/2" Narrow Pillar File.



Representing a 3 1/2" Square File.



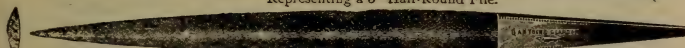
Representing a 3 1/2" Round File.



Representing a 3 1/2" Three-Square File.



Representing a 3" Half-Round File.



Representing a 3 1/4" Crossing File.



Representing a 3" Barrett File, Cut on three sides.



Representing a 3" Barrett File, Cut on one side only.



Representing a 3 1/2" Knife File.



## ❧ BAR IRON ❧

We make Refined Bar Iron from stock especially selected for the purpose. Also, Test Iron made from the best pig iron and guaranteed to stand the test required.

We solicit your inquiries.

### National Bar Iron Manufacturers' Schedule

—OF—

**Minimum Extra Prices above the Base Bar Price, to be Charged for Extra Sizes of Iron.**

Adopted March 16, 1899.

#### ROUNDS AND SQUARES.

$\frac{3}{16}$	.....	2 $\frac{5}{10}$ extra
$\frac{7}{32}$	.....	1 $\frac{3}{10}$ "
$\frac{1}{4}$ to $\frac{9}{32}$	.....	$\frac{9}{10}$ "
$\frac{5}{16}$ to $\frac{11}{32}$	.....	$\frac{7}{10}$ "
$\frac{3}{8}$ to $\frac{13}{32}$	.....	$\frac{5}{10}$ "
$\frac{7}{16}$ to $\frac{15}{32}$	.....	$\frac{4}{10}$ "
$\frac{1}{2}$ to $\frac{9}{16}$	.....	$\frac{3}{10}$ "
$\frac{3}{4}$ to $\frac{11}{16}$	.....	$\frac{2}{10}$ "
$\frac{3}{4}$ to $\frac{7}{8}$	.....	$\frac{1}{10}$ "
1 to $1\frac{1}{8}$	.....	Base sizes no extra
2 to $2\frac{1}{8}$	.....	$\frac{2}{10}$ "
3 to $3\frac{1}{2}$	.....	$\frac{1}{10}$ "
$3\frac{3}{8}$ to 4	.....	$\frac{8}{10}$ "
$4\frac{1}{8}$ to $4\frac{1}{2}$	.....	1 c. "
$4\frac{3}{8}$ to 5	.....	1 $\frac{3}{10}$ "
$5\frac{1}{8}$ to 6	.....	1 $\frac{8}{10}$ "
$6\frac{1}{8}$ to $6\frac{1}{2}$	.....	2 $\frac{2}{10}$ "
$6\frac{3}{8}$ to $7\frac{1}{4}$	.....	2 $\frac{5}{10}$ "

#### FLATS.

$\frac{3}{8}$ to $\frac{7}{16}$ x $\frac{1}{4}$ to $\frac{5}{16}$	.....	1 $\frac{5}{10}$ extra
$\frac{1}{2}$ to $\frac{9}{16}$ x $\frac{1}{4}$ to $\frac{5}{16}$	.....	1 c. "
$\frac{1}{2}$ to $\frac{9}{16}$ x $\frac{3}{8}$ to $\frac{1}{2}$	.....	$\frac{9}{10}$ "
$\frac{5}{8}$ to $\frac{11}{16}$ x $\frac{1}{4}$ to $\frac{5}{16}$	.....	$\frac{7}{10}$ "
$\frac{5}{8}$ to $\frac{11}{16}$ x $\frac{3}{8}$ to $\frac{5}{8}$	.....	$\frac{5}{10}$ "
$\frac{3}{4}$ to $\frac{13}{16}$ x $\frac{1}{4}$ to $\frac{5}{16}$	.....	$\frac{6}{10}$ "
$\frac{3}{4}$ to $\frac{13}{16}$ x $\frac{3}{8}$ to $\frac{3}{4}$	.....	$\frac{4}{10}$ "
1 to $1\frac{1}{8}$ x $\frac{1}{4}$ to $\frac{5}{16}$	.....	$\frac{3}{10}$ "
1 to $1\frac{1}{8}$ x $\frac{3}{8}$ to $\frac{7}{8}$	.....	$\frac{2}{10}$ "
$1\frac{1}{8}$ to $1\frac{3}{8}$ x $\frac{3}{8}$ to 1	.....	$\frac{1}{10}$ "
$1\frac{1}{2}$ to 4 x $\frac{1}{4}$ to $\frac{5}{16}$	.....	$\frac{2}{10}$ "

## FLATS—Continued.

1½ to 4	x ⅜ to 1	Base no extra
1½ to 4	x 1⅞ to 1½	1⅞ extra
2 to 4	x 1½ to 2	1⅞ "
2 to 4	x 2½ to 3	1⅞ "
4¼ to 6	x ¼ to 1⅞	1⅞ "
4¼ to 6	x ⅜ to 1	1⅞ "
4¼ to 6	x 1⅞ to 1½	1⅞ "
4¼ to 6	x 1½ to 2	1⅞ "
4¼ to 6	x 2½ to 3	1⅞ "
6¼ to 6¾	x ¼ to 1⅞	1⅞ "
7 to 8	x ¼ to 1⅞	1⅞ "
6¼ to 8	x ⅜ to 1½	1⅞ "
6¼ to 8	x 1½ to 2	1⅞ "
6¼ to 8	x 2½ to 3	1 c. "
8¼ to 10	x ¼ to 1⅞	1⅞ "
8¼ to 10	x ⅜ to 1	1⅞ "
8¼ to 10	x 1⅞ to 1½	1⅞ "
8¼ to 10	x 1½ to 2	1 c. "

Flats  $\frac{3}{2}$  thick 1⅞ c. per lb. higher than ¼ to 1⅞ thick.

Bevel edge Shaft Iron 1⅞ c. higher than same size of Flats.

All round edge iron 1⅞ c. per lb. extra.

Horse Shoe Iron all sizes 1 c. per lb. extra.

## LIGHT BANDS.

⅜	x Nos. 10, 11 & 12	1⅞ extra
⅜	x No. 9 to 1⅞	1⅞ "
1⅞ to ½	x Nos. 10, 11 & 12	1⅞ "
1⅞ to ½	x No. 9 to 1⅞	1⅞ "
1⅞ to ⅝	x Nos. 10, 11 & 12	1⅞ "
1⅞ to ⅝	x No. 9 to 1⅞	1 c. "
1⅞ to ⅝	x Nos. 10, 11 & 12	1⅞ "
1⅞ to ⅝	x No. 9 to 1⅞	1⅞ "
1⅞ to ⅝	x Nos. 10, 11 & 12	1⅞ "
1⅞ to ⅝	x No. 9 to 1⅞	1⅞ "
1 to 1⅞	x Nos. 10, 11 & 12	1⅞ "
1 to 1⅞	x No. 9 to 1⅞	1⅞ "
1¼ to 4	x Nos. 10, 11 & 12	1⅞ "
1¼ to 4	x No. 9 to 1⅞	1⅞ "
4¼ to 6	x Nos. 10, 11 & 12	1⅞ "
4¼ to 6	x No. 9 to 1⅞	1⅞ "
6¼ to 6¾	x Nos. 10, 11 & 12	1⅞ "
6¼ to 6¾	x No. 9 to 1⅞	1⅞ "
7 to 8	x Nos. 10, 11 & 12	1 c. "
7 to 8	x No. 9 to 1⅞	1⅞ "

Bevel Edge Box Iron same as Light Bands of same sizes.

Beaded Band Iron 1¼" to 2" 1⅞ extra.

Sand Band Iron 1⅞ c. above same sizes of Light Bands.

Cutting to length 1⅞ to 1⅞ extra according to length and size.



# Manufacturers' Standard List of MACHINE BOLTS

With Square Heads and Square  
Nuts. Finished Points.  
Price per Hundred.

Adopted September 20, 1899, to take effect  
October 1, 1899.



Length in Ins	$\frac{1}{4}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	1	1 $\frac{1}{2}$	1 $\frac{3}{4}$
1 $\frac{1}{2}$	1.70	2.00	2.40	2.80	3.60	5.20	7.20	10.50			
2	1.78	2.12	2.56	3.00	3.86	5.58	7.70	11.20	16.00		
2 $\frac{1}{2}$	1.86	2.24	2.72	3.20	4.12	5.96	8.20	11.90	16.90	24.90	
3	1.94	2.36	2.88	3.40	4.38	6.34	8.70	12.60	17.80	26.10	34.50
3 $\frac{1}{2}$	2.02	2.48	3.04	3.60	4.64	6.72	9.20	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	9.70	14.00	19.60	28.50	37.50
4 $\frac{1}{2}$	2.18	2.72	3.36	4.00	5.16	7.48	10.20	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	10.70	15.40	21.40	30.90	40.50
5 $\frac{1}{2}$	2.34	2.96	3.68	4.40	5.68	8.24	11.20	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	11.70	16.80	23.20	33.30	43.50
6 $\frac{1}{2}$	2.50	3.20	4.00	4.80	6.20	9.00	12.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	12.70	18.20	25.00	35.70	46.50
7 $\frac{1}{2}$	2.66	3.44	4.32	5.20	6.72	9.76	13.20	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	13.70	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	14.70	21.00	28.60	40.50	52.56
10	3.06	4.04	5.12	6.20	8.02	11.66	15.70	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	16.70	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	17.70	25.20	34.00	47.70	61.50
13	..	..	6.08	7.40	9.58	13.94	18.70	26.60	35.80	50.10	64.50
14	..	..	6.40	7.80	10.10	14.70	19.70	28.00	37.60	52.50	67.50
15	..	..	6.72	8.20	10.62	15.46	20.70	29.40	39.40	54.90	70.50
16	..	..	7.04	8.60	11.14	16.22	21.70	30.80	41.20	57.30	73.50
17	..	..	..	..	11.66	16.98	22.70	32.20	43.00	59.70	76.50
18	..	..	..	..	12.18	17.74	23.70	33.60	44.80	62.10	79.50
19	..	..	..	..	12.70	18.50	24.70	35.00	46.60	64.50	82.50
20	..	..	..	..	13.22	19.26	25.70	36.40	48.40	66.90	85.50
21	..	..	..	..	..	20.02	26.70	37.80	50.20	69.30	88.50
22	..	..	..	..	..	20.78	27.70	39.20	52.00	71.70	91.50
23	..	..	..	..	..	21.54	28.70	40.60	53.80	74.10	94.50
24	..	..	..	..	..	22.30	29.70	42.00	55.60	76.50	97.50



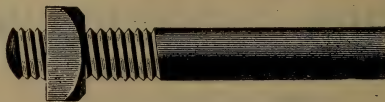
MANUFACTURERS' STANDARD LIST OF  
**COMMON CARRIAGE BOLTS.**  
 PRICE PER HUNDRED.



Adopted January 30, 1895, to take effect February 14, 1895.

Length.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$
$1\frac{1}{2}$	1.00	1.20	..	..	..	..	..
$1\frac{3}{4}$	1.04	1.25	..	..	..	..	..
2	1.08	1.30	1.50	2.20	..	..	..
$2\frac{1}{4}$	1.12	1.35	1.57	2.28	..	..	..
$2\frac{1}{2}$	1.16	1.40	1.64	2.36	..	..	..
$2\frac{3}{4}$	1.20	1.45	1.71	2.44	..	..	..
3	1.24	1.50	1.78	2.52	3.00	5.00	7.20
$3\frac{1}{4}$	1.28	1.55	1.85	2.60	3.10	5.15	7.40
$3\frac{1}{2}$	1.32	1.60	1.92	2.68	3.20	5.30	7.60
$3\frac{3}{4}$	1.36	1.65	1.99	2.76	3.30	5.45	7.80
4	1.40	1.70	2.06	2.84	3.40	5.60	8.00
$4\frac{1}{4}$	1.44	1.75	2.13	2.92	3.50	5.75	8.20
$4\frac{1}{2}$	1.48	1.80	2.20	3.00	3.60	5.90	8.40
$4\frac{3}{4}$	1.52	1.85	2.27	3.08	3.70	6.05	8.60
5	1.56	1.90	2.34	3.16	3.80	6.20	8.80
$5\frac{1}{2}$	1.64	2.00	2.48	3.32	4.00	6.50	9.20
6	1.72	2.10	2.62	3.48	4.20	6.80	9.60
$6\frac{1}{2}$	1.80	2.20	2.76	3.64	4.40	7.10	10.00
7	1.88	2.30	2.90	3.80	4.60	7.40	10.40
$7\frac{1}{2}$	1.96	2.40	3.04	3.96	4.80	7.70	10.80
8	2.04	2.50	3.18	4.12	5.00	8.00	11.20
$8\frac{1}{2}$	2.12	2.60	3.32	4.28	5.20	8.30	11.60
9	2.20	2.70	3.46	4.44	5.40	8.60	12.00
$9\frac{1}{2}$	2.28	2.80	3.60	4.60	5.60	8.90	12.40
10	2.36	2.90	3.74	4.76	5.80	9.20	12.80
11	2.52	3.10	4.02	5.08	6.20	9.80	13.60
12	2.68	3.30	4.30	5.40	6.60	10.40	14.40
13	2.84	3.50	4.58	5.72	7.00	11.00	15.20
14	3.00	3.70	4.86	6.04	7.40	11.60	16.00
15	3.16	3.90	5.14	6.36	7.80	12.20	16.80
16	3.32	4.10	5.42	6.68	8.20	12.80	17.60
17	3.48	4.30	5.70	7.00	8.60	13.40	18.40
18	3.64	4.50	5.98	7.32	9.00	14.00	19.20
19	3.80	4.70	6.26	7.64	9.40	14.60	20.00
20	3.96	4.90	6.54	7.96	9.80	15.20	20.80

# BOLT ENDS



WITH SQUARE NUTS.

Size of Iron.	Length.	Price per lb.	Size of Iron.	Length.	Price per lb.
$\frac{3}{16}$ inch.	6 inch.	.32	$1\frac{1}{4}$ inch.	14 inch.	.11
$\frac{1}{4}$ "	6 "	.25	$1\frac{3}{8}$ "	15 "	.11
$\frac{5}{16}$ "	6 "	.20	$1\frac{1}{2}$ "	16 "	.11
$\frac{3}{8}$ "	7 "	.18	$1\frac{5}{8}$ "	17 "	.12
$\frac{7}{16}$ "	7 "	.16	$1\frac{3}{4}$ "	18 "	.12
$\frac{1}{2}$ & $\frac{9}{16}$ "	8 "	.14	$1\frac{7}{8}$ "	19 "	.12
$\frac{5}{8}$ "	9 "	.12	2 "	20 "	.12
$\frac{3}{4}$ "	10 "	.10	$2\frac{1}{4}$ "	22 "	.14
$\frac{7}{8}$ "	11 "	.10	$2\frac{1}{2}$ "	24 "	.14
1 "	12 "	.10	$2\frac{3}{4}$ "	24 "	.16
$1\frac{1}{8}$ "	13 "	.10	3 "	26 "	.18

Please state on order whether Hot Pressed or Cold Punched C. and T. Nuts are to be furnished. Hexagon Nuts, 10 per cent. extra.

Bolt Ends shorter than above Standard lengths, in lots of 100 and over, will be charged at the price per hundred of Machine Bolts of same length, subject to same discount; in smaller lots extra.

Bolt Ends cut with left hand threads, or with Upset Ends, at special prices.

## WEIGHT OF BOLT ENDS.

With Square Nuts.

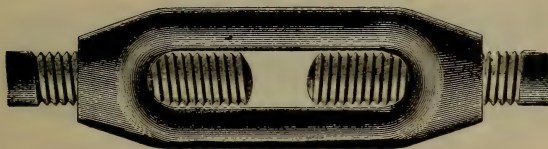
Average Weight Per Hundred.

...	...	$\frac{5}{8}$ x 9	84 lbs.	$1\frac{3}{8}$ x 15	865 lbs.	2 x 20	2400 lbs.
...	...	$\frac{3}{4}$ x 10	145 "	$1\frac{1}{2}$ x 16	1075 "	$2\frac{1}{4}$ x 22	3150 "
$\frac{5}{16}$ x 6	14 lbs.	$\frac{7}{8}$ x 11	210 "	$1\frac{5}{8}$ x 17	1350 "	$2\frac{1}{2}$ x 24	4200 "
$\frac{3}{8}$ x 7	24 "	1 x 12	300 "	$1\frac{3}{4}$ x 18	1670 "	$2\frac{3}{4}$ x 24	5100 "
$\frac{7}{16}$ x 7	34 "	$1\frac{1}{8}$ x 13	445 "	$1\frac{7}{8}$ x 19	1900 "	3 x 26	6400 "
$\frac{1}{2}$ x 8	49 "	$1\frac{1}{4}$ x 14	644 "	...	...	...	...

All Bolt Ends are fitted with U. S. Standard Nuts.

## WROUGHT IRON

## TURNBUCKLES.



With Right and Left Stub Bolt Ends.

Size.	Price.	Size.	Price.
$\frac{3}{8}$ inch,	\$0.40	$1\frac{1}{4}$ inch,	\$2.00
$\frac{7}{16}$ inch,	.42	$1\frac{1}{2}$ inch,	2.25
$\frac{1}{2}$ inch,	.45	2 inch,	2.65
$\frac{9}{16}$ inch,	.48	$2\frac{1}{8}$ inch,	3.10
$\frac{5}{8}$ inch,	.50	$2\frac{1}{4}$ inch,	3.50
$\frac{3}{4}$ inch,	.63	$2\frac{3}{8}$ inch,	4.00
$\frac{7}{8}$ inch,	.75	$2\frac{1}{2}$ inch,	4.50
1 inch,	.88	$2\frac{5}{8}$ inch,	5.00
$1\frac{1}{8}$ inch,	1.00	$2\frac{3}{4}$ inch,	5.50
$1\frac{1}{4}$ inch,	1.25	$2\frac{7}{8}$ inch,	6.00
$1\frac{3}{8}$ inch,	1.38	3 inch,	6.50
$1\frac{1}{2}$ inch,	1.50	$3\frac{1}{4}$ inch,	8.00
$1\frac{5}{8}$ inch,	1.75	$3\frac{1}{2}$ inch,	10.00

Turnbuckles of any length made to order at special prices.

United States Standard Threads used in all cases unless otherwise ordered.

MANUFACTURERS' STANDARD LIST OF  
**COACH AND LAG SCREWS.**  
 WITH SQUARE HEADS.



With Either Cone Points or Gimlet Points.  
 Price Per Hundred.

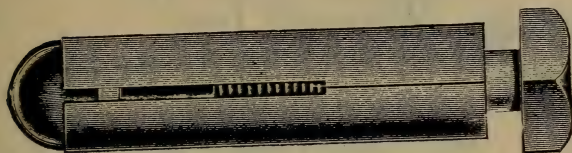
Adopted September 20, 1899, to take effect October 1, 1899.

Length in Inches.	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$ & $\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1½	2.25	2.70	3.15	3.75	..	..	..	..
2	2.45	2.96	3.47	4.11	5.00	..	..	..
2½	2.65	3.22	3.79	4.47	5.50	7.90	..	..
3	2.85	3.48	4.11	4.83	6.00	8.60	12.50	..
3½	3.05	3.74	4.43	5.19	6.50	9.30	13.50	18.20
4	3.25	4.00	4.75	5.55	7.00	10.00	14.50	19.50
4½	3.45	4.26	5.07	5.91	7.50	10.70	15.50	20.80
5	3.65	4.52	5.39	6.27	8.00	11.40	16.50	22.10
5½	3.85	4.78	5.71	6.63	8.50	12.10	17.50	23.40
6	4.05	5.04	6.03	6.99	9.00	12.80	18.50	24.70
6½	..	..	6.35	7.35	9.50	13.50	19.50	26.00
7	..	..	6.67	7.71	10.00	14.20	20.50	27.30
7½	..	..	6.99	8.07	10.50	14.90	21.50	28.60
8	..	..	7.31	8.43	11.00	15.60	22.50	29.90
9	..	..	7.95	9.15	12.00	17.00	24.50	32.50
10	..	..	..	9.87	13.00	18.40	26.50	35.10
11	..	..	..	10.59	14.00	19.80	28.50	37.70
12	..	..	..	11.31	15.00	21.20	30.50	40.30

The following extras are a part of the Coach and Lag Screw List.  
 Hexagon Heads 10 per cent. extra.  
 Skein Screws are sold at the same price as Lag Screws.



# The Perfect—Square Heads.



## PRICE LIST PER HUNDRED.

LENGTH IN INCHES.	DIAMETER.						
	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
1½ .....	\$8.70						
2 .....	8.78						
2½ .....	8.86	\$12.64					
3 .....	8.94	12.76					
3½ .....	9.02	12.88	\$19.40				
4 .....	9.10	13.00	19.60	\$26.70	\$35.40		
4½ .....	9.18	13.12	19.80	27.00	35.84	\$43.60	
5 .....	9.26	13.24	20.00	27.30	36.28	44.20	\$56.00
5½ .....	9.34	13.36	20.20	27.60	36.72	44.80	56.80
6 .....	9.42	13.48	20.40	27.90	37.16	45.40	57.60
6½ .....		13.60	20.60	28.20	37.60	46.00	58.40
7 .....		13.72	20.80	28.50	38.04	46.60	59.20
7½ .....		13.84	21.00	28.80	38.48	47.20	60.00
8 .....		13.96	21.20	29.10	38.92	47.80	60.80
9 .....			21.60	29.70	39.80	49.00	62.40
10 .....			22.00	30.30	40.68	50.20	64.00
11 .....			22.40	30.90	41.56	51.40	65.60
12 .....			22.80	31.50	42.44	52.60	67.20
Length of Case	1½	3	3¾	4	4	4½	5
Diameter of Case	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$	1 $\frac{1}{16}$	1 $\frac{3}{16}$	1 $\frac{5}{16}$	1½

## United States Standard Sizes



# Wrought Iron and Steel Washers

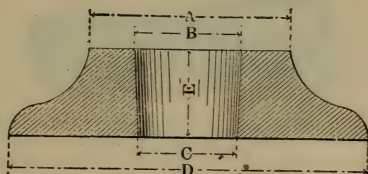
ADOPTED OCTOBER 9, 1895.

In 200-Pound Kegs.

Diameter.	Size of Hole.	Thickness Wire Gauge.	Size of Bolt.	Price per 100 lbs.	Number in 100 lbs.
$\frac{9}{16}$ •	$\frac{1}{4}$	No. 18	$\frac{1}{8}$	\$14.00	39400
$\frac{3}{4}$	$\frac{5}{16}$	" 16	$\frac{1}{4}$	12.20	15600
$\frac{7}{8}$	$\frac{3}{8}$	" 16	$\frac{5}{16}$	11.40	11250
1	$\frac{7}{8}$	" 14	$\frac{3}{8}$	10.50	6800
$1\frac{1}{4}$	$\frac{1}{2}$	" 14	$\frac{7}{8}$	9.70	4300
$1\frac{3}{8}$	$\frac{9}{16}$	" 12	$\frac{1}{2}$	9.20	2600
$1\frac{1}{2}$	$\frac{5}{8}$	" 12	$\frac{9}{16}$	9.10	2250
$1\frac{3}{4}$	$1\frac{1}{8}$	" 10	$\frac{5}{8}$	9.00	1300
*2	$1\frac{3}{8}$	" 10	$\frac{3}{4}$	8.80	1010
*2 $\frac{1}{4}$	$1\frac{5}{8}$	" 9	$\frac{7}{8}$	"	860
*2 $\frac{1}{2}$	$1\frac{7}{8}$	" 9	1	"	625
*2 $\frac{3}{4}$	$1\frac{9}{8}$	" 9	$1\frac{1}{8}$	"	520
3	$1\frac{3}{8}$	" 9	$1\frac{1}{4}$	9.00	400
$3\frac{1}{4}$	$1\frac{1}{2}$	" 8	$1\frac{3}{8}$	"	300
$3\frac{1}{2}$	$1\frac{5}{8}$	" 8	$1\frac{1}{2}$	9.20	280
$3\frac{3}{4}$	$1\frac{3}{4}$	" 8	$1\frac{5}{8}$	"	240
4	$1\frac{7}{8}$	" 8	$1\frac{3}{4}$	9.50	215
$4\frac{1}{4}$	2	" 8	$1\frac{7}{8}$	"	190
$4\frac{1}{2}$	$2\frac{1}{8}$	" 8	2	"	175

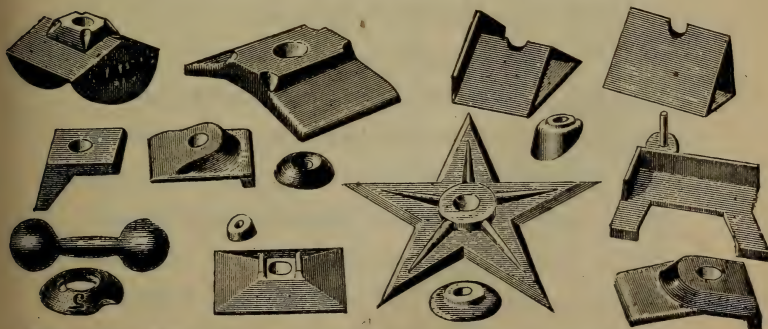
\*Base List.

## CAST-IRON WASHERS.



## STANDARD O. G. CAST WASHERS.

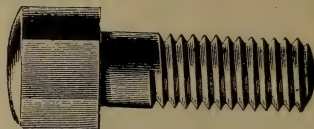
Bolt.	A	B	C	D	E	Weight.
$\frac{1}{2}$	$1\frac{1}{4}$	$\frac{3}{4}$	$\frac{5}{8}$	$2\frac{1}{4}$	$\frac{5}{8}$	$\frac{5}{8}$ lb.
$\frac{3}{8}$	$1\frac{1}{4}$	$\frac{7}{8}$	$\frac{3}{4}$	3	$\frac{3}{8}$	$\frac{3}{4}$ "
$\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{1}{2}$	$\frac{7}{8}$	$3\frac{1}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$ "
$\frac{7}{8}$	$2\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{8}$	$3\frac{3}{8}$	$\frac{3}{4}$	$1\frac{3}{8}$ "
1	$2\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{1}{8}$	4	$1\frac{3}{16}$	$1\frac{1}{2}$ "
$1\frac{1}{8}$	3	$1\frac{3}{8}$	$1\frac{1}{4}$	$4\frac{1}{2}$	$\frac{7}{8}$	$2\frac{1}{2}$ "
$1\frac{1}{4}$	3	$1\frac{5}{8}$	$1\frac{1}{2}$	$5\frac{1}{2}$	$1\frac{1}{4}$	$4\frac{1}{2}$ "
$1\frac{1}{2}$	$3\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{5}{8}$	6	$1\frac{1}{2}$	6 "



Washers of all Shapes and Sizes ; Quoits, Dumb Bells, Star and S Washers, &amp;c.

## CAP SCREWS.

HEXAGON HEADS.



PRICE PER 100.

Diameter Head.	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{13}{16}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
Length Head.	$\frac{9}{32}$	$\frac{11}{32}$	$\frac{13}{32}$	$\frac{15}{32}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{11}{16}$	$\frac{13}{16}$	$\frac{15}{16}$	$1\frac{1}{16}$
Threads to inch.	20	18	16	14	13	12	11	10	9	8
Diameter Screw.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
$\frac{3}{4}$	\$3.00	\$3.25	\$3.75	\$4.40	\$5.50	\$7.00				
1	3.25	3.50	4.00	4.70	5.70	7.00	\$9.50			
$1\frac{1}{4}$	3.50	3.75	4.25	5.00	6.00	7.50	9.50	\$12.20		
$1\frac{1}{2}$	3.75	4.00	4.50	5.30	6.30	8.00	10.00	12.20	\$16.00	
$1\frac{3}{4}$	4.00	4.25	4.75	5.60	6.60	8.50	10.60	12.80	16.60	\$21.20
2	4.25	4.60	5.05	5.95	7.00	9.10	11.20	13.40	17.20	22.30
$2\frac{1}{4}$	....	5.00	5.40	6.35	7.50	9.70	11.90	14.10	17.90	23.60
$2\frac{1}{2}$	.....	.....	5.80	6.80	8.00	10.40	12.70	14.90	18.80	25.10
$2\frac{3}{4}$	.....	.....	.....	7.30	8.60	11.20	13.60	15.90	20.00	26.80
3	.....	.....	.....	.....	9.30	12.10	14.70	17.00	21.80	29.00
Add for each $\frac{1}{4}$ inch.	.30	.40	.50	.60	.80	1.00	1.30	1.60	2.00	2.40





# CASE-HARDENED IRON SET SCREWS.



PRICE PER 100.

Diameter.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$
$\frac{3}{4}$	\$2.00	\$2.20	\$2.50	\$2.90	\$3.40	\$4.25
1	2.15	2.35	2.65	3.10	3.60	4.25
$1\frac{1}{4}$	2.30	2.50	2.80	3.30	3.80	4.50
$1\frac{1}{2}$	2.45	2.65	2.95	3.50	4.00	4.75
$1\frac{3}{4}$	2.60	2.80	3.10	3.70	4.20	5.00
2	2.80	3.00	3.30	3.95	4.45	5.30
$2\frac{1}{4}$	....	3.25	3.55	4.25	4.75	5.65
$2\frac{1}{2}$	....	....	3.85	4.60	5.10	6.05
$2\frac{3}{4}$	....	....	....	5.00	5.50	6.50
3	....	....	....	....	5.95	7.00
Threads to inch.	20	18	16	14	13	12
Add for each $\frac{1}{4}$ inch.	.25	.30	.35	.45	.50	.55

Diameter.	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	\$5.00					
1	5.00	\$7.00				
$1\frac{1}{4}$	5.25	7.00	\$11.80			
$1\frac{1}{2}$	5.50	7.50	11.80	\$14.90		
$1\frac{3}{4}$	5.75	8.00	12.00	15.90	\$19.50	
2	6.05	8.60	12.90	17.00	21.10	\$25.30
$2\frac{1}{4}$	6.40	9.30	13.80	18.40	22.90	27.40
$2\frac{1}{2}$	6.80	10.00	14.80	19.80	24.70	29.60
$2\frac{3}{4}$	7.25	10.80	15.90	21.40	26.70	32.00
3	7.80	11.70	17.10	23.00	28.80	34.60
Threads to inch.	11	10	9	8	7	7
Add for each $\frac{1}{4}$ inch.	.60	1.00	1.30	1.70	2.20	2.80

## STEEL SET SCREWS.



PRICE PER 100.

Diameter of Screw.	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{9}{16}$
$\frac{3}{4}$	\$2.50	\$2.75	\$3.10	\$3.60	\$4.25	\$5.30
1	2.65	2.90	3.30	3.90	4.50	5.30
$1\frac{1}{4}$	2.85	3.10	3.50	4.15	4.75	5.60
$1\frac{1}{2}$	3.05	3.30	3.70	4.40	5.00	5.90
$1\frac{3}{4}$	3.25	3.50	3.90	4.65	5.25	6.25
2	3.50	3.75	4.15	4.95	5.55	6.60
$2\frac{1}{4}$	3.80	4.05	4.45	5.30	5.90	7.05
$2\frac{1}{2}$	4.10	4.45	4.80	5.75	6.35	7.55
$2\frac{3}{4}$	4.45	4.80	5.25	6.20	6.85	8.10
3	4.75	5.20	5.70	6.75	7.45	8.75
Threads to inch.	20	18	16	14	13	12
Add for each $\frac{1}{4}$ inch.	.35	.40	.50	.60	.70	.80

Diameter of screw.	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$
$\frac{3}{4}$	\$6.25					
1	6.25	\$8.75				
$1\frac{1}{4}$	6.55	8.75	\$14.10			
$1\frac{1}{2}$	6.90	9.35	14.10	\$18.60		
$1\frac{3}{4}$	7.25	10.00	15.00	19.80	\$24.40	
2	7.60	10.75	16.10	21.25	26.35	\$31.60
$2\frac{1}{4}$	8.00	11.60	17.25	23.00	28.60	34.25
$2\frac{1}{2}$	8.50	12.50	18.50	24.70	30.85	37.00
$2\frac{3}{4}$	9.05	13.50	19.85	26.65	33.40	40.00
3	9.70	14.60	21.35	28.75	36.00	43.25
Threads to inch.	11	10	9	8	7	7
Add for each $\frac{1}{4}$ inch.	.90	1.30	1.75	2.30	3.00	3.75





## MACHINE SCREWS.

ROUND, FLAT AND FILLISTER HEAD.



Round Head.



Flat Head.



Fillister Head.

IRON MACHINE SCREWS.—List of January 1, 1898.

Per Gross.

Threads to inch.....	48 56 64	48 56 64	32, 36, 40	30 32 36	30 32 36	30 32 36	24, 30, 32	20 24	18 20	16, 18, 20	16, 18	14 16 18	14, 16						
No. ....	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30
Inches.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1/4	25	25	25	29	29	35	35	43	43	55	68	85	105	120	140	165			
5/16	26	26	26	29	29	35	35	43	43	55	74	95	110	125	145	170			
3/8	27	27	27	31	31	38	38	46	46	59	74	95	106	120	140	165			
7/16	29	29	29	33	33	41	41	49	49	64	81	100	115	135	165	190			
1/2	29	29	29	33	33	41	41	49	49	64	81	100	115	135	165	190	235		
5/8	33	33	33	38	38	46	46	54	54	66	81	100	115	135	165	190	245	320	400
3/4	33	33	33	38	38	46	46	54	54	66	81	100	115	135	165	190	245	320	400
7/8	37	37	37	42	42	52	52	63	63	74	89	110	125	145	170	200	270	330	425
1	45	45	45	48	48	58	58	69	69	82	100	120	140	165	190	220	270	330	425
1 1/4	55	55	55	55	55	70	70	85	85	97	115	135	155	180	210	255	310	375	450
1 1/2	75	75	75	75	75	85	85	105	105	125	145	165	185	210	250	300	360	435	525
1 3/4	100	100	100	100	100	115	115	135	135	160	180	200	220	250	300	360	430	510	600
2	100	100	100	100	100	115	115	135	135	160	180	200	220	250	300	360	430	510	600
2 1/4	125	135	135	135	135	170	170	180	200	240	260	280	300	345	415	485	570	665	
2 1/2	160	165	165	165	165	200	200	210	230	275	310	325	370	435	500	585	690	800	
2 3/4	200	230	230	230	230	275	275	275	300	325	345	385	415	485	570	675	775	890	
3	275	325	325	325	325	375	375	375	390	425	465	515	575	650	745	850	970	1100	

## BRASS MACHINE SCREWS.

Round, Flat and Fillister Head.—List of January 1, 1898.—Per Gross.

Threads to inch....	48 56 64	48 56 64	32, 36, 40	30 32 36	30 32 36	24, 30, 32	20 24	18 20 24	16, 18, 20	16, 18	14 16 18	14, 26							
No. ....	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30
Inches.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1/4	22	22	22	40	40	58	58	86	86	100	115	155	200	255	300	360			
5/16	32	32	32	40	40	58	58	86	86	90	115	155	200	255	300	360			
3/8	35	35	35	43	43	62	62	88	88	100	155	200	255	300	360	420			
7/16	36	36	36	43	43	62	62	88	88	90	115	155	200	255	300	360	480	600	
1/2	39	39	39	48	48	68	68	95	95	115	170	210	260	300	360	420	600		
5/8	48	48	48	57	57	77	77	105	105	130	190	235	285	330	390	450	630		
3/4	48	48	48	57	57	77	77	105	105	130	190	235	285	330	390	450	630		
7/8	60	60	60	70	70	90	90	115	115	150	210	260	300	360	420	480	810		
1	72	80	80	105	105	135	135	180	180	230	290	375	470	565	670	790	1125		
1 1/4	90	90	90	120	120	155	155	210	210	260	320	400	520	620	740	860	1200	1575	
1 1/2	100	120	120	150	150	190	190	250	250	310	370	450	560	670	790	910	1245	1540	1875
1 3/4	100	120	120	150	150	190	190	250	250	310	370	450	560	670	790	910	1245	1540	1875
2	150	170	170	190	190	210	210	250	250	300	360	430	530	630	730	830	1155	1470	1835
2 1/4	150	170	170	190	190	210	210	250	250	300	360	430	530	630	730	830	1155	1470	1835
2 1/2	250	270	270	310	310	350	350	415	415	500	590	700	820	940	1060	1180	1565	2040	2425
2 3/4	350	350	350	370	370	400	400	440	440	490	575	670	780	890	1000	1110	1455	1870	2260
3	450	450	450	470	470	500	500	540	540	600	685	790	900	1010	1120	1230	1565	1980	2360
	550	550	550	570	570	600	600	640	640	700	785	890	1000	1110	1220	1330	1665	2080	2460
	650	650	650	670	670	700	700	740	740	800	885	990	1100	1210	1320	1430	1765	2180	2560

## WOOD SCREWS.

IRON WOOD SCREWS.

List of Jan. 1, 1900.

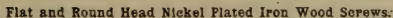


FLAT AND ROUND HEAD, PER GROSS.

$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	$\frac{1}{4}$ inch.	1 inch.
No. 0. .\$.03	No. 0. .\$.03	No. 1. .\$.03	No. 1. .\$.03	No. 2. .\$.03	No. 2. .\$.03	No. 3. .\$.05	No. 3. .\$.07
1. .\$.63	1. .\$.63	2. .\$.63	2. .\$.63	3. .\$.63	3. .\$.63	4. .\$.70	4. .\$.70
2. .\$.63	2. .\$.63	3. .\$.63	3. .\$.63	4. .\$.65	4. .\$.65	5. .\$.70	5. .\$.80
3. .\$.63	3. .\$.63	4. .\$.68	4. .\$.63	5. .\$.70	5. .\$.70	6. .\$.82	6. .\$.87
4. .\$.63	4. .\$.63	5. .\$.64	5. .\$.67	6. .\$.77	6. .\$.82	7. .\$.87	7. .\$.93
	5. .\$.63	6. .\$.66	6. .\$.72	7. .\$.82	7. .\$.87	8. .\$.92	8. .\$.98
	6. .\$.64	7. .\$.76	7. .\$.78	8. .\$.88	8. .\$.92	9. .\$.98	9. .\$.1.00
	7. .\$.71	8. .\$.80	8. .\$.86	9. .\$.92	9. .\$.98	10. .\$.1.06	10. .\$.1.20
	8. .\$.80	9. .\$.84	9. .\$.88	10. .\$.97	10. .\$.1.06	11. .\$.1.10	11. .\$.1.20
	9. .\$.84	10. .\$.87	10. .\$.91	11. .\$.1.05	11. .\$.1.10	12. .\$.1.26	12. .\$.1.26
		11. .\$.92	11. .\$.95	12. .\$.1.10	12. .\$.1.15	13. .\$.1.40	13. .\$.1.40
		12. .\$.1.00	12. .\$.1.00	13. .\$.1.15	13. .\$.1.25	14. .\$.1.60	14. .\$.1.60
		13. .\$.1.03	13. .\$.1.03	14. .\$.1.25	14. .\$.1.35	15. .\$.1.85	15. .\$.1.85
		14. .\$.1.15	14. .\$.1.15	15. .\$.1.40	15. .\$.1.60	16. .\$.2.10	16. .\$.2.10
				16. .\$.1.45	16. .\$.1.85	17. .\$.2.80	17. .\$.2.80
						18. .\$.3.16	18. .\$.3.16
						19. .\$.3.16	19. .\$.3.16
						20. .\$.3.16	20. .\$.3.16
						21. .\$.3.16	21. .\$.3.16
						22. .\$.3.16	22. .\$.3.16
						23. .\$.3.16	23. .\$.3.16
						24. .\$.3.16	24. .\$.3.16
						25. .\$.3.16	25. .\$.3.16
						26. .\$.3.16	26. .\$.3.16
						27. .\$.3.16	27. .\$.3.16
						28. .\$.3.16	28. .\$.3.16
						29. .\$.3.16	29. .\$.3.16
						30. .\$.3.16	30. .\$.3.16
						31. .\$.3.16	31. .\$.3.16
						32. .\$.3.16	32. .\$.3.16
						33. .\$.3.16	33. .\$.3.16
						34. .\$.3.16	34. .\$.3.16
						35. .\$.3.16	35. .\$.3.16
						36. .\$.3.16	36. .\$.3.16
						37. .\$.3.16	37. .\$.3.16
						38. .\$.3.16	38. .\$.3.16
						39. .\$.3.16	39. .\$.3.16
						40. .\$.3.16	40. .\$.3.16
						41. .\$.3.16	41. .\$.3.16
						42. .\$.3.16	42. .\$.3.16
						43. .\$.3.16	43. .\$.3.16
						44. .\$.3.16	44. .\$.3.16
						45. .\$.3.16	45. .\$.3.16
						46. .\$.3.16	46. .\$.3.16
						47. .\$.3.16	47. .\$.3.16
						48. .\$.3.16	48. .\$.3.16
						49. .\$.3.16	49. .\$.3.16
						50. .\$.3.16	50. .\$.3.16
						51. .\$.3.16	51. .\$.3.16
						52. .\$.3.16	52. .\$.3.16
						53. .\$.3.16	53. .\$.3.16
						54. .\$.3.16	54. .\$.3.16
						55. .\$.3.16	55. .\$.3.16
						56. .\$.3.16	56. .\$.3.16
						57. .\$.3.16	57. .\$.3.16
						58. .\$.3.16	58. .\$.3.16
						59. .\$.3.16	59. .\$.3.16
						60. .\$.3.16	60. .\$.3.16
						61. .\$.3.16	61. .\$.3.16

The following varieties of Iron Screws are invoiced from this list at varying discounts: Flat, Round, Fillister and Oval Head  
Screws, Dowel and Fellow Screws, Bright, Blued, Brased, Bronzed, Japanned, Lacquered and Tinned, also Drive Screws

NICKEL PLATED IRON AND BRASS WOOD SCREWS.



List January 1, 1891.

—PER GROSS.—

**Nickel Plated Brass Wood Screws.**

Let. Jan. 1. 1891.

—PER GROSS.—

$\frac{1}{8}$ inch	$\frac{3}{8}$ inch	$\frac{1}{2}$ inch	$\frac{5}{8}$ inch	1 inch	$1\frac{1}{4}$ inch	$1\frac{1}{2}$ inch
No. 4...\$1 65	No. 4...\$1 70	No. 4...\$1 75	No. 4...\$2 10	No. 6...\$2 20	No. 6...\$2 60	No. 7...\$3 25
5...1 75	5...1 75	5...1 85	7...2 30	7...2 40	7...2 70	8...3 35
6...1 80	6...1 90	6...2 00	8...2 55	8...2 70	8...3 00	9...3 70
7...1 90	7...2 00	7...2 10	9...2 75	9...2 95	9...3 30	10...4 20
8...2 05	8...2 15	8...2 35	10...3 10	10...3 35	10...3 75	11...4 80
9...2 15	9...2 40	9...2 55	11...3 55	11...3 80	11...4 30	12...5 45
10...2 45	10...2 70	10...2 90	12...4 15	12...4 30	12...4 45	13...6 10
	11...3 05	11...3 30	13...5 50	13...4 80	13...5 45	14...6 55
	12...3 50	12...3 75	14...5 15	14...5 40	14...6 20	15...7 90
$\frac{1\frac{1}{2}}$ inch		13...4 20	15...6 85	15...6 70	15...7 00	16...8 80
No. 7...\$3 85		14...4 85	16...8 05	16...7 00	16...7 85	17...9 70
8...3 95	2 inch				17...8 70	18...10 60
9...4 05	No. 9...\$4 95	2 $\frac{1}{4}$ inch	2 $\frac{1}{2}$ inch		18...9 50	20...12 65
10...4 45	10...5 10	No. 10...\$6 85	No. 10...\$9 00			
11...5 30	11...5 80	11...7 00	11...9 20			
12...6 00	12...6 60	12...7 20	12...9 35			
13...6 75	13...7 40	13...8 05	13...9 65			
14...7 65	14...8 40	14...9 15	14...9 85			
15...8 05	15...9 45	15...10 25	15...11 00			
16...9 05	16...10 55	16...11 45	16...12 30			
17...10 45	17...11 65	17...12 65	17...13 60			
18...11 70	18...12 75	18...13 85	18...14 90			
20...13 90	20...15 20	20...16 45	20...17 75			
				2 $\frac{3}{4}$ inch	3 inch	
				No. 14...\$11 00	No. 15...\$13 45	
				15...12 40	16...12 80	
				16...13 25	16...14 16	
				17...14 60	17...15 60	
				18...16 00	18...17 05	
				20...19 00	20...20 30	

## WOOD SCREWS.

Brass and Bronze Metal Wood Screws.



List January 1, 1900.

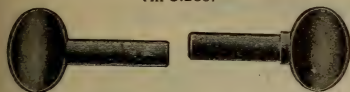
Flat and Round Head.

## PER GROSS.

<b><math>\frac{1}{8}</math> inch.</b> No 0 ... \$0.80 1 ... .80 2 ... .84 3 ... .87 4 ... .91 5 ... .97	<b><math>\frac{3}{8}</math> inch.</b> No. 0 ... \$0.80 1 ... .82 2 ... .86 3 ... .89 4 ... .95 5 ... 1.03 6 ... 1.10 7 ... 1.10 8 ... 1.20 9 ... 1.35	<b><math>\frac{1}{2}</math> inch.</b> No 1 ... \$0.88 2 ... .89 3 ... .95 4 ... 1.03 5 ... 1.10 6 ... 1.20 7 ... 1.30 8 ... 1.50 9 ... 1.70 10 ... 1.90	<b><math>\frac{5}{8}</math> inch.</b> No 1 ... \$0.91 2 ... .91 3 ... .99 4 ... 1.06 5 ... 1.20 6 ... 1.30 7 ... 1.50 8 ... 1.70 9 ... 1.90 10 ... 2.15 11 ... 2.40 12 ... 2.65 13 ... 3.00 14 ... 3.35 15 ... 3.70 16 ... 4.10	<b><math>\frac{3}{4}</math> inch.</b> No 2 ... \$1.06 3 ... 1.10 4 ... 1.15 5 ... 1.30 6 ... 1.45 7 ... 1.60 8 ... 1.90 9 ... 2.15 10 ... 2.40 11 ... 2.65 12 ... 3.00 13 ... 3.35 14 ... 3.70 15 ... 4.10 16 ... 4.60	<b><math>\frac{7}{8}</math> inch.</b> No. 2 ... \$1.35 3 ... 1.40 4 ... 1.45 5 ... 1.60 6 ... 1.65 7 ... 1.80 8 ... 2.05 9 ... 2.35 10 ... 2.65 11 ... 2.95 12 ... 3.35 13 ... 3.70 14 ... 4.10 15 ... 4.65 16 ... 5.05	<b>1 inch.</b> No. 3 ... \$1.55 4 ... 1.60 5 ... 1.65 6 ... 1.70 7 ... 1.85 8 ... 2.30 9 ... 2.60 10 ... 2.85 11 ... 3.30 12 ... 3.65 13 ... 4.10 14 ... 4.65 15 ... 5.00 16 ... 5.65 17 ... 6.65
<b><math>1\frac{1}{4}</math> inch.</b> No 3 ... \$2.05 4 ... 2.10 5 ... 2.15 6 ... 2.20 7 ... 2.25 8 ... 2.65 9 ... 3.00 10 ... 3.25 11 ... 3.65 12 ... 4.35 13 ... 4.85 14 ... 5.35 15 ... 5.95 16 ... 6.65 17 ... 7.20 18 ... 7.85 20 ... 9.85	<b><math>1\frac{1}{2}</math> inch.</b> No. 4 ... \$2.85 5 ... 2.90 6 ... 2.95 7 ... 3.10 8 ... 3.05 9 ... 3.45 10 ... 3.95 11 ... 4.45 12 ... 5.00 13 ... 5.60 14 ... 6.25 15 ... 6.90 16 ... 7.60 17 ... 8.35 18 ... 9.15 20 ... 10.85 22 ... 12.65	<b><math>1\frac{3}{4}</math> inch.</b> No. 6 ... \$3.75 7 ... 3.80 8 ... 3.85 9 ... 3.90 10 ... 4.45 11 ... 5.05 12 ... 5.70 13 ... 6.35 14 ... 7.10 15 ... 7.95 16 ... 8.80 17 ... 9.60 18 ... 10.45 20 ... 12.40 22 ... 14.60 24 ... 16.85	<b>2 inch.</b> No 6 ... \$4.80 7 ... 4.85 8 ... 4.90 9 ... 4.95 10 ... 6.00 11 ... 6.65 12 ... 6.40 13 ... 7.15 14 ... 7.85 15 ... 8.80 16 ... 9.75 17 ... 10.70 18 ... 11.70 20 ... 13.90 22 ... 16.30 24 ... 18.90	<b><math>2\frac{1}{4}</math> inch.</b> No. 8 ... \$8.85 9 ... 6.90 10 ... 6.95 11 ... 7.00 12 ... 7.05 13 ... 7.90 14 ... 8.80 15 ... 9.80 16 ... 10.75 17 ... 11.90 18 ... 13.00 20 ... 16.40 22 ... 18.05 24 ... 20.95	<b><math>2\frac{3}{4}</math> inch.</b> No. 9 ... \$9.40 10 ... 9.50 11 ... 9.65 12 ... 9.60 13 ... 9.65 14 ... 9.70 15 ... 10.75 16 ... 11.85 17 ... 13.00 18 ... 14.30 20 ... 16.95 22 ... 19.85 24 ... 23.00	<b><math>3\frac{1}{4}</math> inch.</b> No. 9 ... \$11.50 10 ... 11.60 11 ... 11.65 12 ... 11.70 13 ... 11.75 14 ... 11.80 15 ... 11.85 16 ... 12.00 17 ... 14.20 18 ... 16.65 20 ... 18.40 22 ... 21.60 24 ... 25.00
<b>3 inch.</b> No. 10 ... \$13.70 11 ... 13.75 12 ... 13.80 13 ... 13.85 14 ... 13.90 15 ... 13.95 16 ... 14.00 17 ... 15.40 18 ... 16.80 20 ... 19.95 22 ... 23.40 24 ... 27.10 26 ... 31.15 28 ... 35.85 30 ... 41.18	<b><math>3\frac{1}{2}</math> inch.</b> No. 10 ... \$15.85 11 ... 16.90 12 ... 16.95 13 ... 16.00 14 ... 16.05 15 ... 16.10 16 ... 16.20 17 ... 17.70 18 ... 19.40 20 ... 22.75 22 ... 26.90 24 ... 31.20 26 ... 35.60 28 ... 41.20 30 ... 47.45	<b>4 inch.</b> No. 12 ... \$18.40 13 ... 18.90 14 ... 18.90 15 ... 19.00 16 ... 19.20 17 ... 20.35 18 ... 22.30 20 ... 26.90 22 ... 30.80 24 ... 36.00 26 ... 40.70 28 ... 47.35 30 ... 54.56	<b><math>4\frac{1}{2}</math> inch.</b> No. 14 ... \$22.40 15 ... 22.80 16 ... 22.80 17 ... 23.40 18 ... 25.75 20 ... 30.90 22 ... 35.40 24 ... 41.40 26 ... 46.80 28 ... 54.40 30 ... 62.70	<b>5 inch.</b> No. 16 ... \$25.80 17 ... 26.90 18 ... 26.90 20 ... 35.50 22 ... 40.70 24 ... 47.60 26 ... 53.80 28 ... 62.60 30 ... 72.15	<b>6 inch.</b> No. 16 ... \$28.20 17 ... 31.00 18 ... 34.05 20 ... 40.80 22 ... 46.80 24 ... 54.75 26 ... 61.90 28 ... 72.95 30 ... 82.95	

The following varieties of Screws are invoiced from this List at varying Discounts. Flat, Round, Fillister and Oval Head Screws, of Brass, Copper, Bronze or Phosphor Bronze, Bronzed or Lacquered.



Drop-Forged Thumb Screw Blanks.  
All Sizes.Plain. Shoulder.  
PRICES PER 100.

LENGTH UNDER HEAD	DIAMETER									
	$\frac{1}{8}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$
$\frac{1}{4}$	\$1 40	2 00	2 50	2 75	3 00	4 00	5 00	..	..	..
$\frac{3}{8}$	1 50	2 10	2 60	2 90	3 25	4 25	5 25	..	..	..
$\frac{1}{2}$	1 60	2 20	2 70	3 05	3 50	4 50	5 50	..	..	..
1	1 70	2 30	2 80	3 20	3 75	4 75	5 75	6 75	7 75	..
$1\frac{1}{4}$	1 80	2 40	2 90	3 35	4 00	5 00	6 00	7 00	8 00	..
$1\frac{1}{2}$	1 90	2 50	3 00	3 50	4 25	5 25	6 25	7 25	8 25	..
$1\frac{3}{4}$	..	2 60	3 10	3 65	4 50	5 50	6 50	7 50	8 50	..
2	..	2 70	3 20	3 80	4 75	5 75	6 75	7 75	8 75	..
$2\frac{1}{4}$	..	..	3 30	3 95	5 00	6 00	7 00	8 00	9 00	..
$2\frac{1}{2}$	..	..	3 40	4 10	5 25	6 25	7 25	8 25	9 50	..
$2\frac{3}{4}$	..	..	..	4 25	5 50	6 50	7 50	8 50	9 75	..
3	..	..	..	4 40	5 75	6 75	7 75	8 75	10 00	..
$3\frac{1}{4}$	..	..	..	4 55	6 00	7 00	8 00	9 00	10 25	..
$3\frac{1}{2}$	..	..	..	4 70	6 25	7 25	8 25	9 25	10 50	..
$3\frac{3}{4}$	..	..	..	4 85	6 50	7 50	8 50	9 50	10 75	..
4	..	..	..	5 00	6 75	7 75	8 75	9 75	11 00	..
$4\frac{1}{4}$	..	..	..	..	7 00	8 25	9 25	10 25	11 50	..
$4\frac{1}{2}$	..	..	..	..	7 25	8 50	9 50	10 50	12 00	..
$4\frac{3}{4}$	..	..	..	..	..	10 25	11 25	12 25	13 50	..
5	..	..	..	..	..	10 75	11 75	12 75	14 00	..
$5\frac{1}{4}$	..	..	..	..	..	..	..	..	..	..
6	..	..	..	..	..	..	..	..	..	..

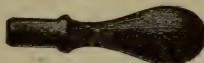
The above are drop-forged from soft steel. All sizes are regular and uniform, and both patterns sold from same list. Please state, when ordering, which one is desired.

## Drop-Forged Thumb Nut Blanks.



Number.....	2	3	4	5	6
Size Bolt.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Price per 100.....	\$3 00	3 50	4 00	4 50	5 00
Number.....	7	8	9	10	12
Size Bolt.....	$\frac{7}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{3}{4}$
Price per 100.....	\$6 00	8 00	10 00	12 00	14 00

## Drop-Forged Machine Handles.



## Unfinished Only.

No.	Length of Shank	Length Over All	Diameter of Shank	Price each
00	$\frac{1}{2}$	2	$\frac{1}{2}$	\$0 04
0	$\frac{1}{2}$	2 $\frac{1}{4}$	$\frac{3}{4}$	05
1	$\frac{3}{4}$	2 $\frac{3}{4}$	$\frac{3}{4}$	06
2	$\frac{3}{4}$	3 $\frac{1}{4}$	$\frac{3}{4}$	08
3	$\frac{3}{4}$	3 $\frac{3}{4}$	$\frac{3}{4}$	10
4	1	4 $\frac{1}{4}$	$\frac{3}{4}$	12
5	1 $\frac{1}{4}$	5 $\frac{1}{4}$	$\frac{3}{4}$	14
6	1 $\frac{1}{4}$	5 $\frac{3}{4}$	$\frac{3}{4}$	16

## SPECIAL SCREWS.

We are prepared to furnish special screws. Send sample or drawing, and we will quote prices on same.

# SPRING COTTERS.



All measurements are made under the eye.

## PRICE PER THOUSAND.

WIRE GAUGE	13	12	11	10	9	8	7	6	5	4	1			
DIAMETER	$\frac{3}{32}$	$\frac{7}{64}$	$\frac{1}{8}$	$\frac{9}{64}$	$\frac{5}{32}$	$\frac{11}{64}$	$\frac{3}{16}$	$\frac{13}{64}$	$\frac{7}{32}$	$\frac{1}{2}$	$\frac{5}{16}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
Length $\frac{1}{2}$ ..	3.75	4.25	4.75	5.00	5.50	6.00								
Length $\frac{3}{4}$ ..	4.40	4.90	5.50	5.80	6.50	7.20	7.50	8.00						
Length 1..	5.00	5.50	6.25	6.60	7.50	8.40	8.80	9.50	12.00	15.00	20.50			
Length $1\frac{1}{4}$ ..	5.60	6.10	7.00	7.40	8.50	9.60	10.10	11.00	13.50	16.50	22.75			
Length $1\frac{1}{2}$ ..	6.20	6.70	7.75	8.20	9.50	10.80	11.40	12.50	15.00	18.00	25.00	28.50		
Length $1\frac{3}{4}$ ..	6.80	7.30	8.50	9.00	10.50	12.00	12.70	14.00	16.50	20.00	27.25	30.75	39.00	
Length 2..	7.40	7.90	9.25	10.00	11.50	13.20	14.00	15.50	18.00	22.00	29.50	33.50	43.50	52.50
Length $2\frac{1}{4}$ ..			10.00	11.00	12.50	14.40	15.30	17.00	19.50	24.00	31.75	36.00	47.25	57.75
Length $2\frac{1}{2}$ ..			10.75	12.00	13.50	15.60	16.80	18.50	21.00	26.25	34.00	38.75	51.00	63.00
Length $2\frac{3}{4}$ ..							18.30	20.50	23.50	28.00	36.75	40.50	54.75	68.00
Length 3..							19.80	22.50	25.00	30.00	39.75	43.25	58.50	73.50
Length $3\frac{1}{4}$ ..										32.00	42.75	46.00	62.25	78.75
Length $3\frac{1}{2}$ ..										34.00	45.00	48.75	66.00	84.00
Length $3\frac{3}{4}$ ..										36.50	47.25	51.75	69.75	89.25
Length 4..										39.00	49.50	54.75	73.50	94.50
Length 5..											88.50	115.50	160.50	
Length 6..												136.00	184.50	

Box containing 100 Assorted Cotters suitable for Agricultural Implements.....Price, \$2 00  
Our Spring Cotters are headed and pointed by special patented machinery, and highly finished.

## FLAT SPRING KEY.



Superseding all previous lists. In effect April 1, 1896.  
Price Per Thousand.

Width .....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$
Length, $1\frac{1}{4}$ ..	14 00	21 00		
Length, $1\frac{1}{2}$ ..	15 75	22 75		
Length, $1\frac{3}{4}$ ..	17 50	24 50	26 25	
Length, 2..	19 25	26 25	28 00	34 25
Length, $2\frac{1}{4}$ ..	21 00	28 00	30 75	36 75
Length, $2\frac{1}{2}$ ..	22 75	29 75	33 25	39 25
Length, $2\frac{3}{4}$ ..	24 50	31 50	36 00	42 00
Length, 3..	26 25	33 25	38 50	44 75
Length, $3\frac{1}{4}$ ..			41 25	47 25
Length, $3\frac{1}{2}$ ..			43 75	50 00

We make to order for Plow Makers a special size ( $\frac{1}{4} \times 1\frac{1}{4}$ ), to be used in Clevis Pins. They are much superior to leather.

## SPRING KEYS.



No. 000.....	per 100, \$0 50
No. 00.....	per 100, 55
No. 0.....	per 100, 60
No. 1.....	per 100, 65
No. $1\frac{1}{2}$ .....	per 100, 68
No. 2.....	per 100, 70
No. 3.....	per 100, 75
No. 4.....	per 100, 80

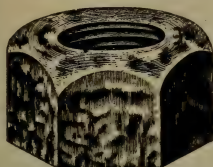
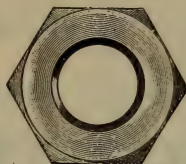
## FLAT RIVETED KEYS.



Over forty different sizes and patterns.  
Prices Upon Application.

## Manufacturers' Standard List.

## Finished Case Hardened and Semi-Finished

Hexagon  
Nuts.

The thread and outside of each **Finished Nut** are made to an accurate gauge, and to the standard adopted by the U. S. Government. First-class in all respects.

The **Semi-Finished Nuts** correspond with the Finished Nuts in all dimensions; they are our rough Cold Punched U. S. Standard Nuts, tapped and faced true on the bottom.

Bolt.	Width.	Thickness.	Number of Threads.	Finished Case-Hardened Nuts, Price per 100.	Finished Case-Hardened with Double Chamfer, Price per 100*	Semi-Finished Nuts, Bottom Faced, Price per 100.	Semi-Finished, with Double Chamfer, or Top & Bottom Finish, Price per 100.
$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	20	\$6.00	\$6.50	\$2.00	\$2.50
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	18	7.00	7.50	2.50	2.75
$\frac{3}{8}$	$\frac{11}{16}$	$\frac{3}{8}$	16	8.00	8.75	3.25	4.00
$\frac{7}{16}$	$\frac{23}{32}$	$\frac{7}{16}$	14	9.00	10.00	3.75	4.75
$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	13 or 12	10.00	11.00	4.00	5.00
$\frac{9}{16}$	$\frac{5}{8}$	$\frac{9}{16}$	12	12.00	13.00	5.00	6.00
$\frac{5}{8}$	$1\frac{1}{16}$	$\frac{5}{8}$	11	15.00	16.50	6.00	7.50
$\frac{11}{16}$	$1\frac{3}{8}$	$\frac{11}{16}$	11	20.00	22.00	8.50	10.50
$\frac{3}{4}$	$1\frac{1}{4}$	$\frac{3}{4}$	10	20.00	22.00	8.50	10.50
$\frac{7}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	9	25.00	27.50	11.00	13.50
1	$1\frac{3}{8}$	1	8	35.00	38.50	15.00	18.50
$1\frac{1}{8}$	$1\frac{1}{2}$	$1\frac{1}{8}$	7	45.00	49.50	20.00	24.50
$1\frac{1}{4}$	2	$1\frac{1}{4}$	7	60.00	66.00	27.00	33.00
$1\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{3}{8}$	6	75.00	82.00	39.00	46.50
$1\frac{1}{2}$	$2\frac{3}{4}$	$1\frac{1}{2}$	6	95.00	105.00	55.00	64.00
$1\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{3}{4}$	$5\frac{1}{2}$	125.00	138.00	72.00	83.50
$1\frac{7}{8}$	$2\frac{3}{4}$	$1\frac{7}{8}$	5	155.00	170.00	105.00	119.00
2	$2\frac{1}{2}$	2	5	210.00	230.00	130.00	148.00
$2\frac{1}{8}$	3	2	$4\frac{1}{2}$	275.00	300.00	160.00	182.00
$2\frac{1}{4}$	$3\frac{1}{2}$	$2\frac{1}{4}$	$4\frac{1}{2}$	500.00	550.00	285.00	265.00
$2\frac{1}{2}$	$3\frac{3}{4}$	$2\frac{1}{2}$	4	850.00	950.00	375.00	415.00
$2\frac{3}{4}$	$4\frac{1}{2}$	$2\frac{3}{4}$	4	1200.00	1350.00	500.00	560.00
3	$4\frac{3}{4}$	3	$3\frac{1}{2}$	1800.00	2000.00	800.00	900.00

\*In lots of 100 and more; small lots at discretion.

Finished Nuts, not Case-Hardened, at regular prices: Polished, not Case-Hardened, at 10 per cent. advance.

Nuts Polished after Case-Hardening, 30 per cent. additional.

Case-Hardened Semi-Finished Nuts, 20 per cent. additional.

Semi-Finished Square Nuts made to order.

Check Nuts in limited numbers, at discretion; in 100 lots at regular prices.

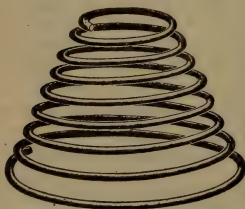
**SPRINGS**

GROUND.

**POP VALVE SPRINGS.**

Send samples of just what you require, tell  
just how it works and we can surely  
give you satisfaction.

ALL SPRINGS CAREFULLY TESTED.

**VALVE SPRINGS.**

Made of Steel Japanned, Brass or Bronze.

Send sample of just what is wanted.

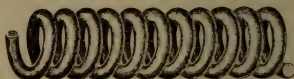
OIL TEMPERED STEEL  
Extension & Compression Springs.

**EXTENSION SPRINGS.**

Regular Hooks



Regular Loops.

**COMPRESSION SPRINGS**

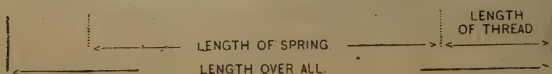
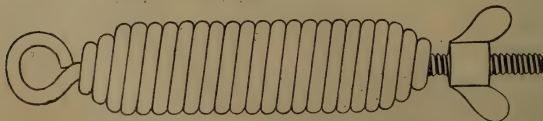
Plain Ends.



Squared Ends.



Squared and Ground Ends

**TAPERED ENDS, SWIVEL EYE AND BOLT,**



**BLACKSMITHS' TOOLS.**

1260

Square Punch.



1290

Cold Chisel.



1270

Round Punch.



1250

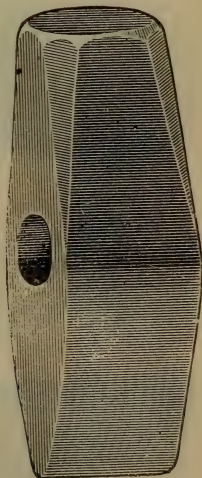
Set Hammer.

**SLEDGE HAMMERS.**

810—Cross Peins.



860—Western Pattern.



820

Straight Pein.

PRICES: { 5 lbs. and over ..... 30 cents per pound  
 { 3 lbs. to 5 lbs ..... 36 cents per pound

## BLACKSMITHS' TOOLS.



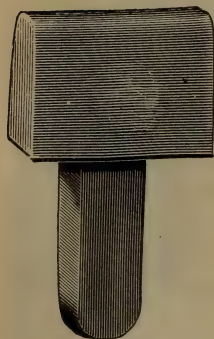
Top Swage  
1900



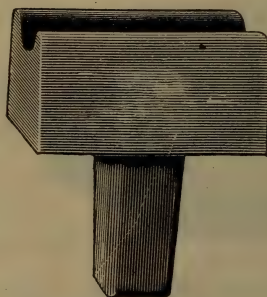
Square Flatter.  
1230



Top Fuller.  
1210



1220—Bottom Fuller.



1220—Bottom Swage

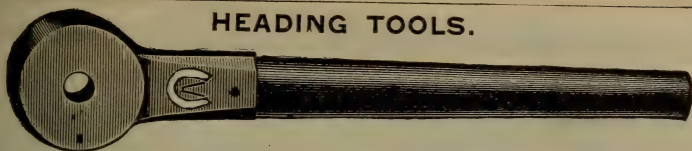


HOT CHISEL.—Price 42 cents per pound.



Hardie.  
1310

## HEADING TOOLS.



42 cents per pound.

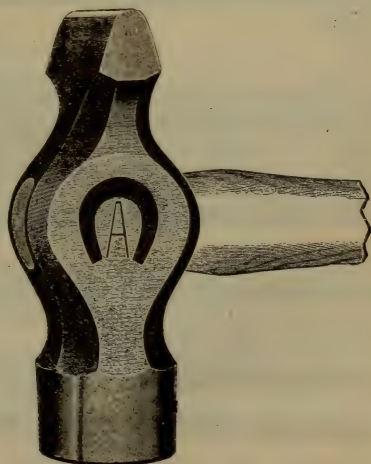
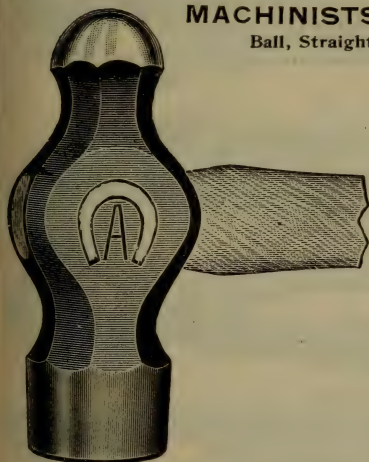


## WROUGHT IRON LADLES.

Size .....	2½	3	3½	4	5	6	7	8	9	10
Price per dozen .....	\$3 00	3 85	4 40	5 50	7 50	9 25	18 00	21 50	27 00	35 75
Extra Heavy .....										42 75

## MACHINISTS' HAMMERS.

Ball, Straight and Cross Pein.



Number .....	00000	0000	000	00	0	1	2
Weight .....	4 oz.	6 oz.	8 oz.	12 oz.	1 lb.	1 lb. 4 oz.	1 lb. 8 oz.
Price .....	Per Dozen	\$12 00	12 00	12 00	12 50	13 50	14 50
Number .....		3	4	5	6	7	8
Weight .....		1 lb. 12 oz.	2 lbs.	2 lbs. 4 oz.	2 lbs. 8 oz.	2 lbs. 12 oz.	3 lbs.
Price .....		\$15 50	16 50	17 50	19 00	20 50	22 00

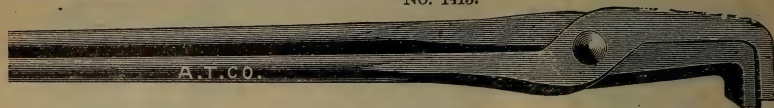
Full Polished List \$3.00 Per Dozen higher than above. Weights do not include handles.



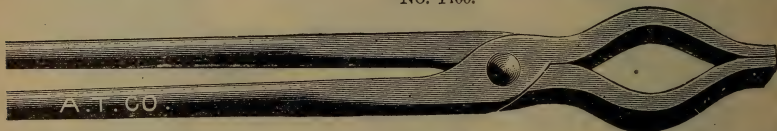
# BLACKSMITHS' TONGS.



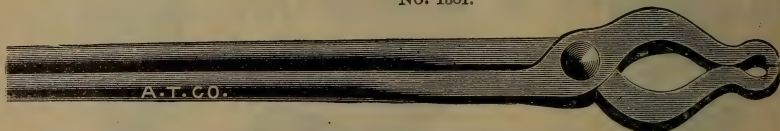
No. 1413.



No. 1100.



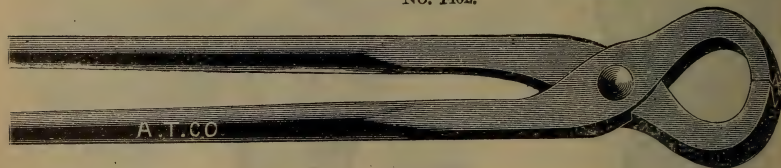
No. 1381.



No. 1382.



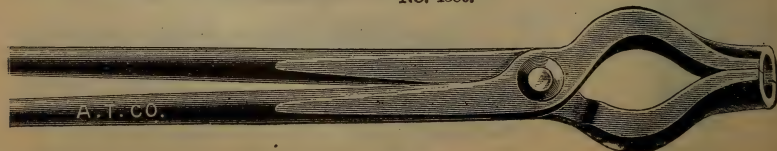
No. 1402.



No. 1391,



No. 1380.



Curved Lip.



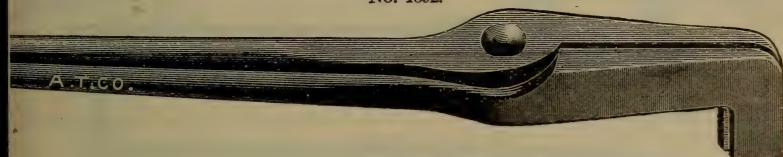
## BLACKSMITHS' TOOLS.



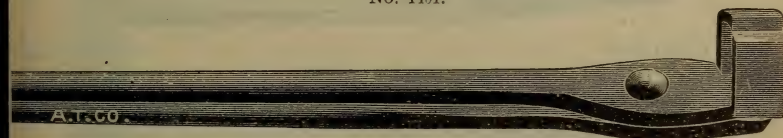
No. 1380.



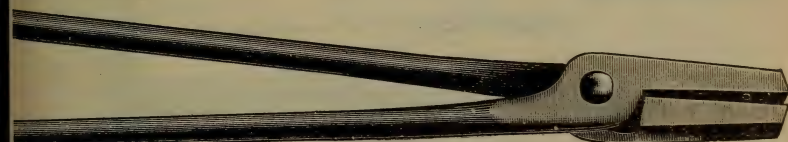
No. 1382.



No. 1401.



No. 1414,



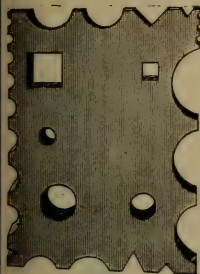
## Straight Lip.

## PRICE PER DOZEN.

Length, inches	14	16	18	20	22	24	26	28	30
Straight Lip	\$5 20	5 60	6 00	6 80	7 60	8 40	9 20	10 00	10 80
Curved Lip	7 50	8 50	9 50	10 50	12 00	13 50	15 00	17 00	19 00
No. 1380—Double Pick-up	40c. per lb.								
" 1381—Single Pick-up	40c.	"	"	"	"	"	"	"	"
" 1382—Rivet	60c.	"	"	"	"	"	"	"	"
" 1390—Gad	40c.	"	"	"	"	"	"	"	"
" 1391—Bolt	40c.	"	"	"	"	"	"	"	"
No. 1392—Round Jaw	40c. per lb.								
" 1400—Angle Jaw	60c.	"	"	"	"	"	"	"	"
" 1401—Band	60c.	"	"	"	"	"	"	"	"
" 1402—Blacksmiths' Clip	\$1.20	"	"	"	"	"	"	"	"
" 1413—Lathe Tool	60c.	"	"	"	"	"	"	"	"
No. 1414—Pick	60 cents per lb.								



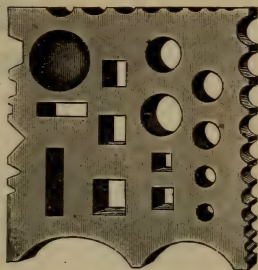
## CAST IRON SWAGE BLOCKS.



Shape of Nos. 1, 2 and 3.

Number	Measures Inches.	Weight Lbs.
1	3 $\frac{5}{8}$ x 10 x 14	About 100
2	3 $\frac{5}{8}$ x 11 x 15	" 125
3	4 $\frac{1}{8}$ x 11 x 15	" 145
4	4 x 15 x 15	" 165
4 $\frac{1}{2}$	4 $\frac{1}{2}$ x 18 x 18	" 235
5	6 x 24 x 24	" 625

Price per lb.....



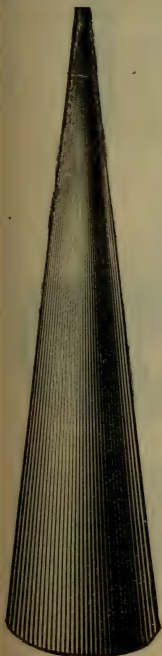
Shape of Nos. 4 and 5.

## B. S. CONES OR MANDRELS.

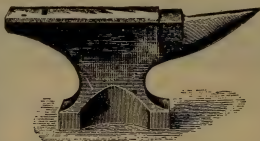
CAST IRON.

Size.	Height.	Diameter at Base.	Diameter at Top.	Weight.
No. 1	32 in.	8 in.	1 in.	About 55 lbs.
" 1 $\frac{1}{2}$	40 "	10 "	1 "	" 90 "
" 2	48 "	12 "	1 "	" 115 "
" 3	52 "	14 "	1 "	" 140 "
" 4	54 "	16 "	2 "	" 200 "

Price per lb.....



## THE SAMSON ANVIL.



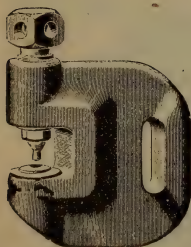
This Anvil combines an unusually handsome design with great strength and a very fine temper and finish. The face is crucible steel much heavier than generally used. The horn has a solid point and a facing of tough, untempered steel, with a long, heavy shank welded underneath to the steel facing. These facings are very thick and heavy, and give strength to the anvil and durability to the parts in general use. Owing to a peculiar process and skill in welding the heavy facings to cast iron, we are able to produce an anvil which will successfully stand the most severe use.

The temper is of the very best character. The face is true and highly polished. The finish is superior. Every anvil is guaranteed.

## PRICES.

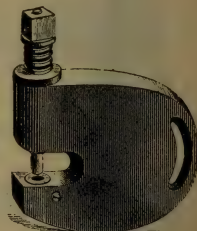
Weight of Anvil, Pounds	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Price.....Each	4.50	5.00	5.50	6.25	7.50	9.00	10.50	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50
Weight of Anvil Pounds	160	175	200	225	250	275	300	325	350	375	400	425	450	475	500
Price.....Each	24.00	26.25	30.00	33.75	37.50	41.25	45.00	48.75	52.50	56.25	60.00	63.75	67.50	71.25	75.00

## STEEL SCREW PUNCH.



- No. 00, punches  $\frac{1}{8}$  in. hole in  $\frac{1}{4}$  in. iron,  
1  $\frac{1}{2}$  in. from edge of sheet..... \$20 00
- No 0, punches  $\frac{1}{8}$  in. hole in  $\frac{1}{4}$  in. iron, 1  $\frac{1}{2}$   
in. from edge of sheet ..... 24.00
- No. 1, punches  $\frac{1}{8}$  in. hole in  $\frac{1}{2}$  in. iron, 1  $\frac{1}{2}$   
in. from edge of sheet..... 30 00
- No 2, punches  $\frac{3}{8}$  to  $\frac{1}{2}$  in. hole in  $\frac{1}{2}$  in. iron  
2 in. from edge of sheet..... 40 00
- No 3, punches  $\frac{3}{8}$  in. hole in  $\frac{3}{4}$  in. iron, 2  $\frac{1}{2}$   
in. from edge of sheet ..... 60 00
- No 4, punches  $\frac{3}{8}$  in. hole in  $\frac{3}{4}$  in. iron, 3  $\frac{1}{2}$   
in. from edge of sheet..... 80 00
- No 5, punches  $\frac{3}{8}$  in. hole in  $\frac{3}{4}$  in. iron, 4  
in. from edge of sheet ..... 90 00
- No 6 punches 1 in. hole in 1 in. iron, 4 in.  
from edge of sheet ..... 100 00

One Punch and Die furnished. Extra Punches  
and Dies per pair: Nos. 00 and 0, \$3 00. Nos. 1  
and 2, \$4 00. Nos. 3, \$5 00. Nos. 4, 5 and 6, \$6 00.



Turner Boiler Screw Punch.

Having a 2-inch Screw, three  
Punches and Dies to punch  
holes for  $\frac{1}{2}$  inch,  $\frac{3}{8}$  inch and  $\frac{3}{4}$   
inch iron, and each Punch is  
furnished with a Wrought Iron  
Lever  
Price ..... \$30 00  
" extra large ..... 35 00



## LATHE DOGS.



## HEAVY STEEL DOG.

## PRICE LIST.

No.	Size.	Price.	No.	Size.	Price.
1	$\frac{3}{8}$	\$0 40	12	$\frac{1}{2}$	\$1 20
2	$\frac{3}{8}$	50	13	$\frac{3}{4}$	1 35
3	$\frac{3}{8}$	60	14	$\frac{1}{2}$	1 45
4	$\frac{3}{8}$	60	15	3	1 60
5	$\frac{3}{8}$	70	16	$\frac{3}{8}$	1 80
6	$\frac{3}{8}$	70	17	4	2 10
7	$\frac{1}{2}$	80	18	$\frac{1}{2}$	2 75
8	$\frac{1}{2}$	80	19	5	3 25
9	$\frac{1}{2}$	95	20	$\frac{5}{8}$	4 00
10	$\frac{1}{2}$	95	21	6	5 00
11	$\frac{1}{2}$	1 10			

Small set of eight, consisting of Nos. 1, 2, 4, 6, 8, 10, 11 and 12..... 6 25

Set of twelve, consisting of Nos. 1, 2, 4, 6, 8, 10, 11, 12, 14, 16, 18 and 17..... 13 20

Full set of nineteen..... 23 60

## STEEL (Straight Tail) LATHE DOG.

## PRICE LIST.

No.	Size.	Price.	No.	Size.	Price.	No.	Size.	Price.
1	$\frac{3}{8}$	\$0 60	8	$\frac{1}{2}$	\$1 10	15	$\frac{1}{2}$	\$2 75
2	$\frac{3}{8}$	70	9	$\frac{1}{2}$	1 20	16	$\frac{1}{2}$	3 25
3	1	70	10	$\frac{1}{2}$	1 35	17	$\frac{1}{2}$	4 00
4	$\frac{1}{2}$	80	11	$\frac{1}{2}$	1 45	18	$\frac{1}{2}$	5 00
5	$\frac{1}{2}$	80	12	$\frac{1}{2}$	1 60	19	$\frac{1}{2}$	6 00
6	$\frac{1}{2}$	95	13	$\frac{1}{2}$	1 80	20	$\frac{1}{2}$	7 00
7	$\frac{1}{2}$	95	14	$\frac{1}{2}$	2 10			

Small set of 9 (Nos. 1 to 9 inclusive)..... \$7 80

Full set of 20..... 44 10

## LIGHT STEEL DOG.

WITH HARDENED STEEL SCREWS TURNED IN LATHE.



No.	Size. Inches.	Price.	No.	Size. Inches.	Price.
1	$\frac{3}{8}$	.35	7	$\frac{1}{2}$	1.00
2	$\frac{3}{8}$	.35	8	$\frac{1}{2}$	1.10
3	$\frac{3}{8}$	.50	9	$\frac{1}{2}$	1.40
4	1	.60	10	$\frac{1}{2}$	1.50
5	$\frac{1}{2}$	.75	11	$\frac{1}{2}$	1.70
6	$\frac{1}{2}$	.85	12	$\frac{1}{2}$	1.90



STRAIGHT TAIL

WRENCHES.

Fitting screw heads from  $\frac{3}{8}$  to  $\frac{1}{2}$  inch square.  
Price..... 75



16 15 17 53 22 19 20 21



## Coal Picks.

No.	Weight	Per doz.	No.	Weight	Per doz.
16	2 lbs	\$ 50	16	5 lbs	\$11 60
16	2 1/2	9 00	16	5 1/2	12 00
16	3	9 50	16	6	12 50
16	3 1/2	10 00	16	6 1/2	13 00
16	4	10 50	16	7	14 00
16	4 1/2	11 00			

## Adze Eye Coal Picks.

No. 15 Same List as No. 16

## Anthracite Coal Picks.

No. 17 Same List as No. 16

## Alton Pattern Coal Picks.

No. 53 Long Bar pattern, 50c per doz additional on List of No. 16.

Special Coal Picks of any desired pattern made to order from duplicate or drawing

No. 18	6 to 7 lbs.	per doz	\$16 50
18	7 " 8 "		17 50
18	8 " 9 "		18 50



## HAZEL HOES.

No. 69 Hazel Hoes, prd. \$14 00

## PLOW ANVILS.

No. 70 Solid Steel, net per lb

## SOLID CAST STEEL SLEDGES.



No.	Smiths' Sledges	3 lbs. and over	4 to 5 lbs.	Under 3 lbs.
34	Stone	\$0 30	\$0 36	\$0 45
35	Striking	30	36	45
37	Coal	30	36	45

## SOLID CAST STEEL HAMMERS.



No.	Hand Drilling Hammers	3 lbs. and over	4 to 5 lbs.	Under 3 lbs.
43	Napping	\$0 36	\$0 40	\$0 45
45	Mason	30	36	45
39	Smiths' Hand	40	45	50
42	Drilling or Strick	30	36	45
44	Single Face Spall g.	36	40	45
41	Double			

## Solid Cast Steel Mauls, Steel Wedges, Etc.



No. 51	Steel Wedges, Coal	per lb.	\$0 20
52	Wood		20
50	Truckee, 1st Qual.		25
50	2d "		20
49	Ship or Top Maul, all sizes		42
46	Wood Choppers' Maul, straight cut		36
53	Stone or Granite Axe, all sizes		36
67	Octagon Pattern, Turning Sledge		40

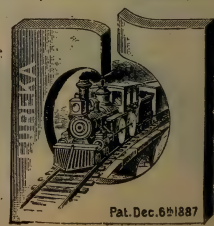
Steel-Faced. Instead of Solid Cast Steel hammers and sledges made in any desired pattern to order.

## STANDARD RAILROAD TRACK TOOLS.



47	Steel Spike Maul	\$ 30	61	Steel Rail Fork	\$ 20
48	Track Chisel	25	62	Rail Tongs	20
57	Sledge, dbl. faced	30	63	Crow Bar	
58	Track Punch, round point	25	64	wedge point, 8	
59	Track Punch, square point	25	65	Crow Bar, pinch point, 8	
60	Track Wrench, 14	66	66	Tamping Bar, 10	
				Claw Bar, 12	

NOTE—We are manufacturing a patent Erie Nut Lock, under the name of Erie Nut Lock Co., being a spring lock washer, the best device known for holding nuts and bolts secure on all kinds of iron and wood work—many thousands have been in practical use and have proved to fail in their efficiency.



No. 1.

## SOLID BOX VISES.



	Each
No. 25 3 1/2 in Jaw.	\$12 00
" 30 3 1/2 " "	" 11 00
" 35 4 " "	" 10 00
" 40 4 " "	" 10 50
" 45 4 1/2 " "	" 11 00
" 50 4 1/2 " "	" 11 50
" 55 4 1/2 " "	" 12 00
" 60 4 1/2 " "	" 13 00
" 65 5 " "	" 14 00
" 70 5 " "	" 15 00
" 75 5 1/2 " "	" 16 00
" 80 5 1/2 " "	" 17 50
" 85 5 1/2 " "	" 18 50
" 90 5 1/2 " "	" 20 00
" 95 5 1/2 " "	" 21 00
" 100 6 " "	" 22 00
" 105 6 " "	" 23 00

	Each		Each
No. 110 6 1/2 in Jaw.	\$24 00	No. 145 7 in Jaw.	\$35 00
" 115 6 1/2 " "	" 25 00	" 150 7 " "	" 36 00
" 120 6 1/2 " "	" 26 00	" 160 7 1/2 " "	" 41 50
" 125 6 1/2 " "	" 27 50	" 170 7 1/2 " "	" 44 50
" 130 6 1/2 " "	" 29 00	" 180 8 " "	" 53 00
" 135 6 1/2 " "	" 31 50	" 190 8 " "	" 53 00
" 140 7 " "	" 33 00	" 200 8 " "	" 56 00

## HORSE SHOERS' VISES.

	Each
No. 60 6 inch Jaw	\$18 00
" 65 6 " "	" 19 50
" 70 6 " "	" 21 00

## MATTOCKS.



No.	Adze Eye, Long Cutter,	6 lbs., per doz	\$17 00
" 3	Short	5 1/2 "	" 16 50
" 2	Long	Light	" 16 00
" 3	Short	"	" 16 00
" 4	Hunt Eye, Long	6 lbs.	" 17 00
" 5	Short	5 1/2 "	" 16 50
" 6	Adze Eye, Pick Mattocks	"	" 17 00
" 7	Hunt	"	" 17 00

## ACCOMAC HOES.

	6 in	6 1/2 in	7 in
Heavy	per doz \$18 00	19 00	20 00
Light	14 50	15 00	16 00

## COOPER FROES



	Per doz		Per doz
No. 10 8 inches	\$13 00	No. 10 14 inches	\$14 50
" 10 10 " "	" 13 50	" 10 16 " "	" 15 00
" 10 12 " "	" 14 00		

8

## GRUB HOES.

9



No. 8 Western Pattern, No. 0.	3 lbs., per doz	\$11 50
" 8 " " " 1, 3 1/2 "	" 12 00	
" 8 " " " 2, 4 " "	" 12 50	
" 8 " " " 3, 4 1/2 " "	" 13 00	
" 9 Baltimore " 1, 3 1/2 "	" 13 00	
" 9 " " " 2, 4 1/2 " "	" 13 00	
" 9 " " " 3, 5 " "	" 14 00	
" 9 " " " 4, 5 1/2 " "	" 15 00	

## PICKS.

11 12 54 55 56 14 13 18



## Railroad or Clay Picks.

No. 11 Adze Eye, 4 to 5 lbs.	per doz	\$11 50
" 11 " " 6 " "	" 12 00	
" 11 " " 7 " "	" 13 50	
" 11 " " 8 " "	" 14 50	
" 11 " " 9 " "	" 16 50	
" 11 " " 10 " "	" 18 50	
" 12 Hunt Eye, 4 " "	" 11 50	
" 12 " " 5 " "	" 12 50	
" 12 " " 6 " "	" 13 50	
" 12 " " 7 " "	" 14 50	

Straight Weights,	4 lb.	5 lb.	6 lb.	7 lb.	8 lb.	9 lb.	10 lb.
	\$11 50	12 00	13 00	14 00	15 50	17 50	19 50

## Ore Picks.

Regular point and chisel ends, or double pointed when ordered. Extra quantity and quality of steel when ordered.

No. 54 Adze Eye, 5 to 6 lbs.	per doz	\$12 50
" 54 " " 6 " "	" 13 50	
" 54 " " 7 " "	" 14 50	

## Adze Eye Contractors' Picks.

No. 55 Adze Eye, 7 lbs.	per doz	\$18 00
" 55 " " 7 1/2 " "	" 18 50	
" 55 " " 8 " "	" 19 00	
" 55 " " 8 1/2 " "	" 20 00	
" 55 " " 9 " "	" 21 00	
" 55 " " 9 1/2 " "	" 22 00	
" 55 " " 10 " "	" 23 00	

## Steel Lake Superior Mining Picks.

No. 56.....Special Price and Quality

## Tamping Picks.

No. 14 Adze Eye, 6 to 7 lbs.	per doz	\$18 00
" 14 " " 7 " "	" 19 00	
" 14 " " 8 " "	" 20 00	
" 13 Hunt Eye, 6 " "	" 18 00	
" 13 " " 7 " "	" 19 00	
" 13 " " 8 " "	" 20 00	

Straight Weights,	6 lb.	7 lb.	8 lb.	9 lb.
	\$18 00	19 50	21 00	

## Adze Eye Miners' Picks.

19 Surface, No. 1, 4 lbs.	14 00	20 Drift, No. 3, 3 1/2 lbs.	\$15 00
" 19 " " 2, 4 1/2 " "	15 00	" 4, 5 " "	16 00
" 19 " " 3, 5 " "	16 00	" 5, 6 " "	17 50
" 19 " " 4, 5 1/2 " "	17 00	" 1, 3 1/2 " "	15 00
" 19 " " 5, 6 " "	18 00	" 2, 4 " "	16 00
" 19 " " 6, 8 " "	19 00	" 3, 4 1/2 " "	17 00
" 19 " " 7, 7 " "	20 00	" 4, 5 " "	18 50
" 20 Drifting, 1, 3 " "	12 50	" 5, 6 " "	20 00
" 20 " " 2, 4 " "	14 00	" 6, 6 1/2 " "	21 50

## Mill Picks.

No. 22 Mill Picks, Cast Steel, 2 to 3 lbs., per doz. \$22 00





## THE YALE & TOWNE DIFFERENTIAL BLOCKS.

The only Differential Blocks made under direct license from the inventor and patentee Thos. A. Weston.

Special irons are used in the sheaves and chains and the latter are gauged by a patented process which raises the elastic limit of the chains and insures accuracy in the pitch of the links.

Capacity in Tons.	Price Complete.	Hoist in Feet.	Extra Hoist, Price per Foot.*	Net Weight in Pounds.
$\frac{1}{8}$	\$18.00	5	\$2.80	11
$\frac{1}{4}$	18.00	6	2.80	22
$\frac{1}{2}$	21.00	7	2.80	30
1	28.00	8	3.00	51
$1\frac{1}{2}$	36.00	$8\frac{1}{2}$	3.20	81
2	45.00	9	3.40	122
3	60.00	$9\frac{1}{2}$	4.00	180

\*Each additional foot of hoist requires 4 feet of additional chain.

## THE YALE & TOWNE DUPLEX BLOCKS.

Screw Gear. Patented.

For all around use these are compact, powerful and convenient. Durability and safety are combined with lightness, making these blocks the easiest of all to handle.

Capacity in Tons.	Price Complete.	Hoist in Feet.	Extra Hoist, Price per Foot.	Net Weight in Pounds.
$\frac{1}{2}$	\$25.00	8	\$1.25	43
1	30.00	8	1.30	57
$1\frac{1}{2}$	40.00	8	1.35	76
2	50.00	9	1.40	104
3	70.00	10	1.50	200
$3\frac{1}{2}$	80.00	10	1.90	210
4	95.00	10	1.95	225
5	125.00	12	2.00	340
6	150.00	12	2.80	360
7	175.00	12	3.00	370
8	200.00	12	3.10	390
10	250.00	12	3.20	570



Differential.



Duplex.

## THE YALE & TOWNE TRIPLEX BLOCKS.

### SPUR GEARED.

Where the use is frequent, these blocks are displacing all others as they *save half the time and half the labor*, the resulting economy soon repaying their cost. This is due to their high "mechanical efficiency," which avoids the large waste of power by friction in other types of blocks.



Triplex.

Capacity in Tons.	Price Complete.		Hoist in Feet.	Extra Hoist, Price per Foot.	Net Weight in Pounds.
	Single Upper Hook	Double Upper Hook			
$\frac{1}{2}$	\$35.00	. . .	8	\$0.90	51
1	45.00	. . .	8	.95	89
$1\frac{1}{2}$	60.00	. . .	8	1.00	133
2	70.00	. . .	9	1.05	203
3	90.00	\$80.00	10	1.50	206
4	110.00	95.00	10	1.60	307
5	140.00	120.00	12	2 15	397
6	165.00	145.00	12	2.15	417
8	200.00	175.00	12	2.70	505
10	240.00	215.00	12	3.25	622
12	300.00	265.00*	12	4.30	800
16	360.00	300.00*	12	5.40	1000
20	425.00	350.00*	12	6.50	1150

\*Treble Upper Hook.

The newest and best equipped shops are now using Triplex Blocks extensively because of their great economy in time and labor.

SIZES 3 TO 20 TONS HAVE LOWER BLOCK.

QUICK SPEED: A special gearing is made for  $\frac{1}{4}$  and 1 ton sizes. This handles light loads at double speed, but requires double the chain pull.

## THE IMPROVED HARRINGTON HOISTS.

### Prices of Hoists.

Weight of Machine	Lift	To Raise	Price	Extra Lift Per Foot
35 lbs.	8 ft.	500 lbs.	\$22.50	\$1.00
52 "	8 "	1,000 "	25.00	1.20
65 "	8 "	2,000 "	30.00	1.50
76 "	8 "	3,000 "	40.00	1.75
140 "	9 "	4,000 "	50.00	2.00
226 "	10 "	6,000 "	75.00	2.20
258 "	10 "	8,000 "	95.00	2.40
625 "	12 "	10,000 "	140.00	3.00
750 "	12 "	12,000 "	180.00	3.75
875 "	12 "	16,000 "	210.00	4.00
925 "	12 "	20,000 "	275.00	4.25

### Shortest Distance Between Hooks of

500-lb. Hoist is 14½ inches.	8,000-lb. Hoist is 31 inches.
1,000 " " 16 "	10,000 " " 39 "
2,000 " " 17 "	12,000 " " 39 "
3,000 " " 20 "	16,000 " " 40 "
4,000 " " 22 "	20,000 " " 61 "
6,000 " " 28 "	

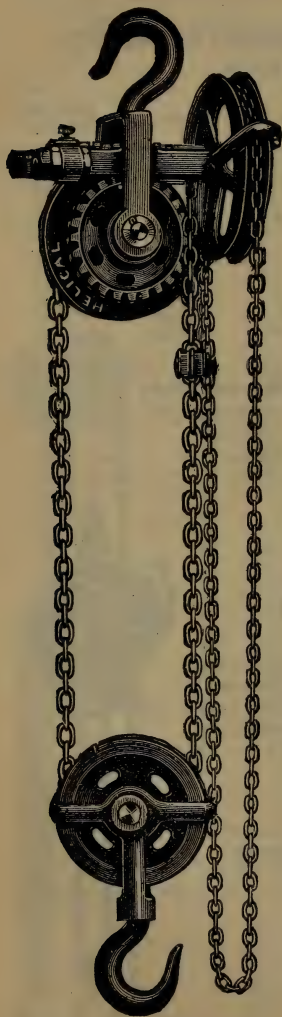
## KEYSTONE SPUR-GEARED HOIST.

To meet the demand for a quick lift hoist we are putting on the market a hoist of the spur gear type, having a very high efficiency. It holds the load at any point, and is equipped with two load chains in the same manner as the screw hoist. We consider this the best hoist in the market. It will raise a given load twice as fast as the screw hoist.

We are offering the following sizes:

To Lift.	Capacity.	Price	Extra Lift Per Foot.
6 ft.	1,000 lbs.	\$35.00	\$1.20
8 "	2,000 "	45.00	1.50
8 "	3,000 "	60.00	1.75
9 "	4,000 "	70.00	2.00
10 "	6,000 "	90.00	2.20
10 "	8,000 "	110.00	2.40
12 "	10,000 "	140.00	3.00





## HELICAL PULLEY BLOCK.

WITH LUBRICATED COUNTER WEIGHT.

The height of Lift should be stated when ordering.

For No. 1, the length of Chain required is about four times the height of Lift; for No. 2, six times; and for No. 3, eight times.

This includes the Hand Chain.

Weights, measurements and powers must be taken as approximate.

*Illustrations are given as a general guide and are not binding as to detail.*

We reserve the right to alter anything in this List without notice.

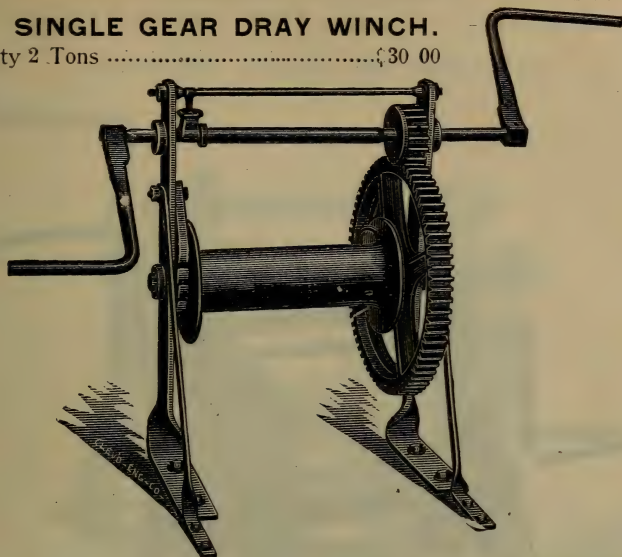
## HELICAL SCREW HOIST LIST.

Lift.	Tested to	Price	Extra Lift Per Foot.
8 feet.	$\frac{1}{4}$ ton.	\$22 50	\$1 00
8 "	$\frac{1}{2}$ "	25 00	1 20
8 "	1. "	30 00	1 50
8 "	$1\frac{1}{2}$ "	40 00	1 75
9 "	2 "	50 00	2 00
10 "	3 "	75 00	2 20
10 "	4 "	95 00	2 40
12 "	5 "	140 00	3 00
12 "	6 "	180 00	3 75
12 "	8 "	260 00	4 75
12 "	10 "	340 00	6 00
12 "	12 "	420 00	7 00
12 "	15 "	500 00	8 00
14 "	20 "	800 00	13 00

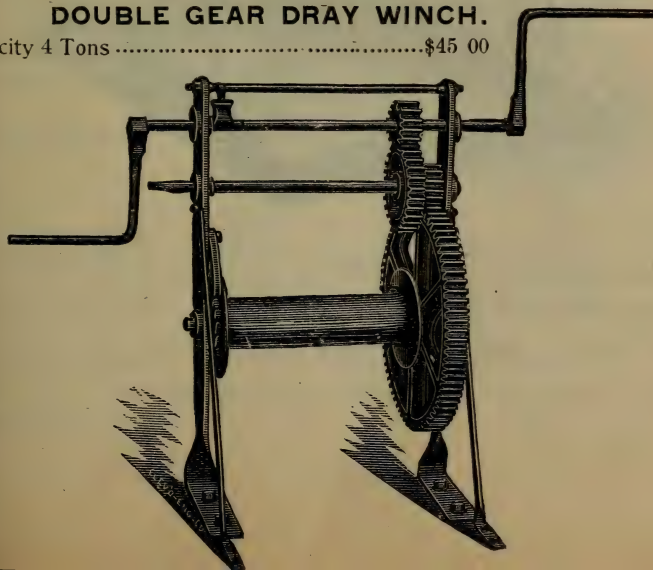


**SINGLE GEAR DRAY WINCH.**

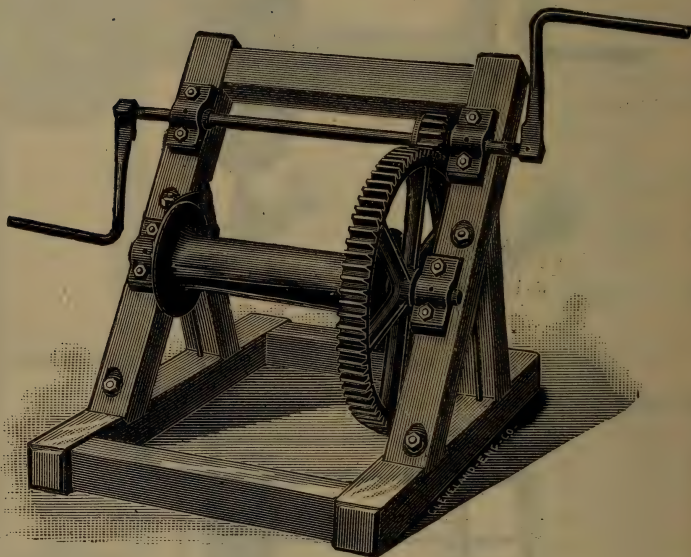
Capacity 2 Tons .....\$30 00

**DOUBLE GEAR DRAY WINCH.**

Capacity 4 Tons .....\$45 00

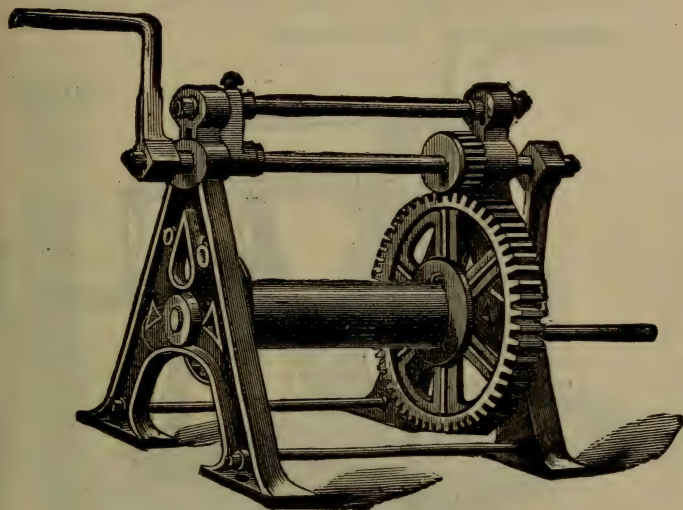


## INCLINED WINCH.



Single geared, as per cut, with pawl stop.....	\$40 00
Couple Geared, with pawl stop.....	56 00
Hand Brake for either, extra.....	6 00

## HOISTING CRABS OR WINCHES.

*Single Purchase Crab.*

## SINGLE PURCHASE.

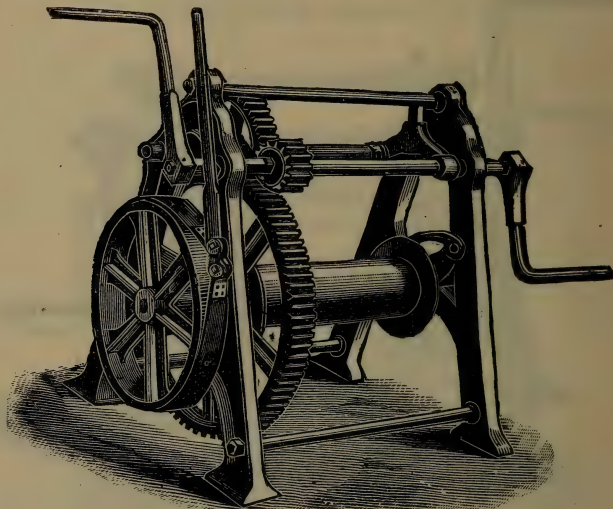
No.	Tons.	With Brake.	Without Brake.	No.	Ton.	With Brake.	Without Brake.
1	2	\$27 00	\$22 50	4	5	\$40 00	\$35 00
2	3	30 00	25 00	5	6	52 00	44 00
3	4	35 00	29 00	6	9	62 00	53 00

Crabs having screw brakes, add 5 per cent. to above list prices.

We can furnish concave drums, if desired, also other drums of special design upon application.

## IRON HOISTING CRABS.

FOR MANILLA ROPE, WIRE ROPE OR CHAIN.



*Double Purchase Crab.*

Single Purchase and Double Purchase, with cast-iron or wrought-iron sides.  
Pawl stop to all.

Crank Shaft can be thrown out of gear when lowering with brake so that the handles will remain stationary.

Will lift one-fifth of the capacity direct from the barrel.

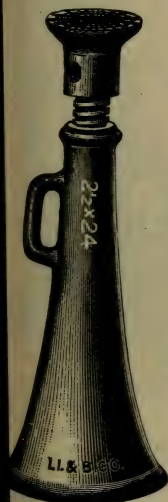
Capacities based upon using  $\frac{1}{2}$  and 3 Sheave Rope Blocks in connection with Crab.

### DOUBLE PURCHASE.

No.	Ton.	With Brake.	Without Brake.	No.	Ton.	With Brake.	Without Brake.
10	4	\$40 00	\$35 00	14	12	\$82 00	\$73 00
11	5	46 00	40 00	15	15	104 00	94 00
12	6	59 00	50 00	16	18	132 00	118 00
13	9	69 00	60 00	17	24	180 00	160 00



**PRICE LIST**  
**OF**  
**LOCOMOTIVE JACK SCREWS.**



Diameter of Screw.	Height of Stand.	Price.	Diameter of Screw.	Height of Stand.	Price.
1 1/4 in.	4 in.	\$ 2.90	2 in.	24 in.	\$13.50
1 1/4 "	6 "	3.10	2 1/4 "	6 "	7.00
1 1/4 "	8 "	3.40	2 1/4 "	8 "	7.50
1 1/4 "	10 "	3.80	2 1/4 "	10 "	8.25
1 1/4 "	12 "	4.20	2 1/4 "	12 "	9.00
1 1/4 "	14 "	4.60	2 1/4 "	14 "	10.00
1 1/2 "	4 "	3.25	2 1/4 "	16 "	11.00
1 1/2 "	5 "	3.50	2 1/4 "	18 "	12.00
1 1/2 "	6 "	3.75	2 1/4 "	20 "	13.25
1 1/2 "	8 "	4.25	2 1/4 "	22 "	14.50
1 1/2 "	10 "	4.75	2 1/4 "	24 "	15.75
1 1/2 "	12 "	5.25	2 1/2 "	6 "	7.75
1 1/2 "	14 "	6.00	2 1/2 "	6 1/2 "	8.00
1 1/2 "	16 "	6.75	2 1/2 "	8 "	8.75
1 3/4 "	6 "	4.50	2 1/2 "	10 "	9.75
1 3/4 "	8 "	5.00	2 1/2 "	12 "	10.75
1 3/4 "	10 "	5.75	2 1/2 "	14 "	12.00
1 3/4 "	12 "	6.25	2 1/2 "	16 "	13.25
1 3/4 "	14 "	6.75	2 1/2 "	18 "	14.50
1 3/4 "	16 "	7.50	2 1/2 "	20 "	15.75
1 3/4 "	18 "	8.50	2 1/2 "	22 "	17.00
2 "	5 "	5.00	2 1/2 "	24 "	18.25
2 "	6 "	5.25	2 1/2 "	28 "	22.00
2 "	8 "	6.00	2 1/2 "	32 "	26.00
2 "	10 "	6.75	3 "	14 "	19.50
2 "	12 "	7.50	3 "	16 "	20.75
2 "	14 "	8.25	3 "	18 "	22.00
2 "	16 "	9.25	3 "	20 "	23.25
2 "	18 "	10.25	3 "	22 "	24.50
2 "	20 "	11.50	3 "	24 "	25.75
2 "	22 "	12.50	3 "	30 "	30.00

Capacity.		For Height over all add to Height of stand.	
1 1/4 inch Screws	10 Tons	2 1/4 inches.	
1 1/2 " "	12 "	2 1/2 "	
1 3/4 " "	16 "	2 3/4 "	
2 " "	20 "	3 1/4 "	
2 1/4 " "	24 "	3 3/4 "	
2 1/2 " "	28 "	4 "	
3 " "	36 "	4 1/4 "	

Lever will be sent only when ordered, and will be charged extra.

## CAR BOX JACK SCREWS. PRICE LIST.



Diameter of Screw.	Height of Stand.	Price.	Diameter of Screw.	Height of Stand.	Price.
1 1/2 in.	5 in.	\$4.00	2 in.	12 in.	\$ 8.00
1 1/2 "	6 "	4.25	2 "	14 "	8.75
1 1/2 "	8 "	4.75	2 1/4 "	8 "	8.00
1 1/2 "	10 "	5.25	2 1/4 "	10 "	8.75
1 1/2 "	12 "	5.75	2 1/4 "	12 "	9.50
1 3/4 "	6 "	5.00	2 1/4 "	14 "	10.50
1 3/4 "	8 "	5.50	2 1/4 "	16 "	11.50
1 3/4 "	10 "	6.25	2 1/2 "	6 1/2 "	8.50
1 3/4 "	12 "	6.75	2 1/2 "	8 "	9.25
2 "	5 "	5.50	2 1/2 "	10 "	10.25
2 "	6 "	5.75	2 1/2 "	12 "	11.25
2 "	8 "	6.50	2 1/2 "	14 "	12.50
2 "	10 "	7.25	2 1/2 "	16 "	13.75



		Capacity.	For Height over all add to Height of stand.	
1 1/2 inch screws.	12 Tons.		3 inches.	
1 3/4 " "	16 " "		3 1/4 " "	
2 " "	20 " "		4 " "	
2 1/4 " "	24 " "		4 1/4 " "	
2 1/2 " "	28 " "		4 1/2 " "	

## WAGON JACK SCREWS.

These Jacks are made with wrought iron screws and cast iron stands

Diameter of Screw.	Height of Stand.	Capacity.	Price.
1 1/2 inches.	12 inches.	12 Tons.	\$5.25
1 1/2 "	14 "	12 "	6.00
1 1/2 "	16 "	12 "	6.75
1 3/4 "	14 "	16 "	6.75
1 3/4 "	16 "	16 "	7.50

## CAST IRON JACK SCREWS.

These Screws are cast with seamless threads which make them very smooth and uniform.

Diameter of Screw.	Height Over All.	Price.	Diameter of Screw.	Height Over All.	Price.
3 in.	20 in.	\$3.50	3 in.	30 in.	\$4.75
3 "	22 "	3.75	3 "	32 "	5.00
3 "	24 "	4.00	3 "	34 "	5.25
3 "	26 "	4.25	3 "	36 "	5.50
3 "	28 "	4.50			





### No. 8, LOCOMOTIVE JACK.

Height, 12 inches.

Weight, 27 lbs.

Capacity, 20 tons.

Gun Metal Nut.

Steel Screw, 2 inches in diameter.

Ratchet Box, Head and Stand of malleable iron.

Price .....\$20.00

### No. 9, COACH JACK.

Height, 31 inches.

Rise, 21 inches.

Weight, 100 lbs.

Capacity, 30 tons.

Gun Metal Nut, 4 inches deep.

Steel Screw, 2½ inches in diameter.

Close 1 Ratchet, Head and Stand made of the best Air Furnace Malleable Iron.

**THE BEST COACH SCREW EVER OFFERED  
TO THE TRADE.**

Price .....\$60.00

Voluntary testimonials from leading railroad men state that after years of use there is no perceptible wear.

**Results Speak for Themselves.**





### No. 1 JACK.

The height of this Jack is 16 inches, the run of the bar being 10 inches. Bar  $1\frac{3}{8} \times 1\frac{1}{4}$ .

Weight of Jack, 32 lbs.

Capacity, 4,000 lbs.

Foot-lift, 2,000 lbs.

It is used for Threshing Machines, Portable Engines, etc.

With the extra bottom No. 58, and head No. 57, it is intended for heavy wagons such as oil tank wagons, etc.

Price .....\$10.00

**EASY TO HANDLE. MADE OF THE BEST MATERIAL.**

**Hardened Steel Bushings and Pins Used.**

### No 3, GENERAL PURPOSE JACK.

The height of this Jack is 19 inches; the raise of the bar being 11 inches.

Size of Bar,  $1\frac{3}{4} \times 1\frac{1}{2}$ .

Weight of the Jack, 60 lbs.; with a capacity of 8 tons, with foot-lift.

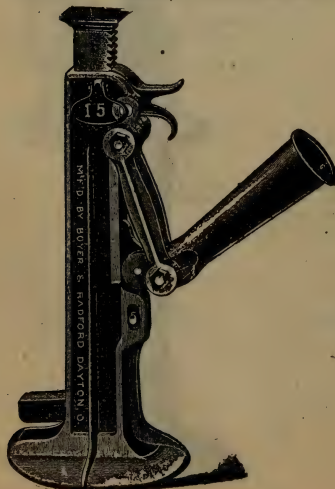
It is used for track work also.

The Ratchet Bar is reinforced the full length by a  $\frac{3}{4}$ -inch wrought iron bolt to which the head is screwed, this gives the bar more rigidity and strength.

Each Jack has two small handles, one on each side.

Price .....\$16.00

**Hardened Steel Bushings and Pins Used.**



### No. 15 JACK.

**ENTIRELY SAFE.**

**Will not slip under load.**



The height of this Jack is 28 inches; the rise of bar is 15 inches, size  $2 \times 2\frac{3}{8}$  inches.

Weight of Jack, 115 lbs.

Capacity, 15 tons.

It is a car and heavy yard Jack.

Starting to lift the load with the lever at an angle of 30 degrees.

The Ratchet Bar is reinforced the full length by a 1-inch wrought iron bolt to which the head is screwed, this gives the bars more rigidity and strength.

One small handle on each side.

Price .....\$35.00





**No. 20,  
DROP TRACK JACK.**

Capacity, 10 tons.  
Rise,  $11\frac{1}{2}$  inches.  
Weight, 50 lbs.  
Size of Bar,  $1\frac{1}{2} \times 1\frac{3}{4}$  inches.  
Size of Base,  $7 \times 12$  inches.

Price .....\$20.00

**No. 17, JOURNAL OR AXLE BOX JACK.**

The Ratchet Bar is reinforced the full length by a  $\frac{3}{4}$ -inch wrought iron bolt to which the head is screwed, this gives the bar more rigidity and strength.

Size of Bar,  $1\frac{3}{8} \times 1\frac{1}{2}$  inches.

Height of Jack,  $11\frac{1}{2}$  in.

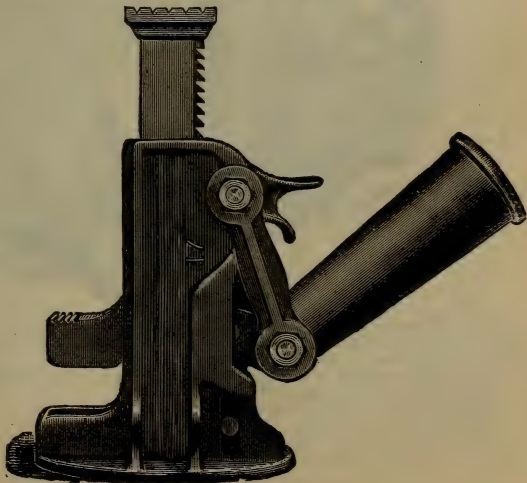
The Rise of the Bar being 5 inches.

Weight of Jack, 48 lbs.

Capacity, 6 tons.

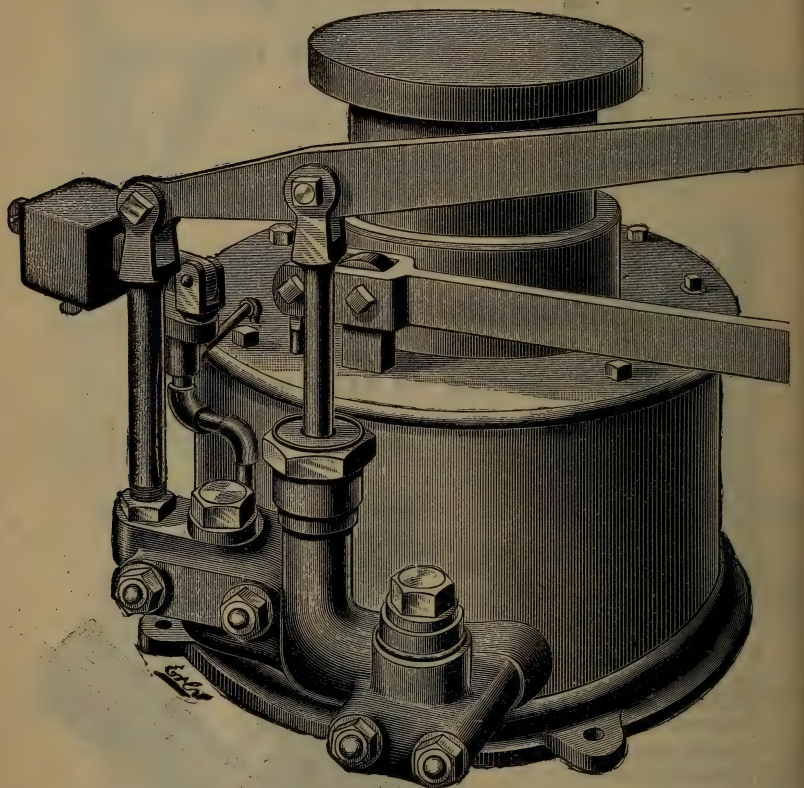
It is used for Truck or Axle Box Jack.

Price .....\$16.00



**HYDRAULIC PRESS.**

No. 2.



This Press has a capacity of 50 tons pressure. It is intended for pressing boxes into hubs, and for pressing on hub bands for farm and freight wagons, and other purposes where great pressure is required.

The pump is made of brass, the balance of cast and wrought iron.

Diameter of ram plunger, 8 inches.

Diameter of pump plunger, from 1 to 1½ inches.

It will raise six inches. Weight, about 600 pounds.

It can be operated by hand or power.

Full directions are furnished with each machine.

Price, boxed.....\$110.00.

## STUBS' STEEL WIRE GAUGE.



No. 107.

Numbers by Gauge.	Length.	Price per Dozen.	Price Each	Numbers by Gauge.	Length.	Price per Dozen.	Price Each
1 to 5	4	\$2 35	\$0 22	31 to 35	25	\$1 40	\$0 14
6 to 10	3 1/2	2 25	21	36 to 40	2 3/4	1 25	12
11 to 15	3 1/4	2 10	20	41 to 45	2 1/4	1 10	10
16 to 20	3 1/4	1 95	19	46 to 60	2 1/2 to 1 3/4	95	09
21 to 25	3 1/4	1 75	17	61 to 70	1 1/2	90	08
26 to 30	2 1/2	1 55	15	71 to 80	1 1/2 to 3/4	1 00	09

## JOBBER'S DRILLS.



No. 105.

No. 106.

Jobbers and Machinists' Sets				Letter Sizes			
Diameter	Length	Price per dozen	Price each	Diameter	Decimals of 1 inch	Length	Price per dozen
1/8	2 1/2	\$1 00	\$0 09	A 1 1/4 inch.	.234	3 1/2	\$2 90
3/16	2 3/4	1 10	10	B 1 1/2 inch.	.238	3 1/2	3 00
1/4	2 3/4	1 20	11	C 1 3/4 inch.	.242	3 1/2	3 10
5/16	2 3/4	1 30	12	D 1 7/8 inch.	.246	3 1/2	3 20
3/8	3	1 45	13	E 2 inch.	.250	3 1/2	3 30
7/16	3 1/4	1 60	15	F 2 1/4 inch.	.257	4 1/2	3 40
1/2	3 1/4	1 80	16	G 2 1/2 inch.	.261	4 1/2	3 50
9/16	3 3/4	2 00	18	H 2 3/4 inch.	.266	4 1/2	3 60
5/8	3 3/4	2 20	20	I 3 inch.	.272	4 1/2	3 70
3/4	3 3/4	2 40	21	J 3 1/4 inch.	.277	4 1/2	3 80
7/8	3 3/4	2 65	23	K 3 1/2 inch.	.281	4 1/2	3 90
1	3 3/4	2 90	26	L 3 3/4 inch.	.290	4 1/2	4 00
1 1/8	4	3 15	28	M 4 inch.	.295	4 1/2	4 10
1 1/4	4 1/4	3 35	30	N 4 1/4 inch.	.302	4 1/2	4 20
1 1/2	4 1/4	3 65	32	O 4 1/2 inch.	.316	4 1/2	4 30
1 3/4	4 1/4	3 90	35	P 4 3/4 inch.	.323	4 1/2	4 40
2	4 1/2	4 20	37	Q 5 inch.	.332	4 1/2	4 60
2 1/4	4 3/4	4 50	40	R 5 1/4 inch.	.339	4 1/2	4 80
2 1/2	4 3/4	4 80	42	S 5 1/2 inch.	.348	4 1/2	5 00
2 3/4	4 3/4	5 10	45	T 5 3/4 inch.	.358	4 1/2	5 20
3	4 3/4	5 40	48	U 6 inch.	.368	5	5 40
3 1/4	5 1/4	5 70	50	V 6 1/4 inch.	.377	5	5 60
3 1/2	5 1/4	6 00	53	W 6 1/2 inch.	.386	5 1/2	5 80
3 3/4	5 1/4	6 30	55	X 6 3/4 inch.	.397	5 1/2	6 00
4	5 1/4	6 60	58	Y 7 inch.	.404	5 1/2	6 40
4 1/4	5 1/4	7 20	63	Z 7 1/4 inch.	.413	5 1/2	6 80
4 1/2	5 1/4	7 50	65				59
4 3/4	5 1/4	7 75	67				
5	5 1/4	8 00	70				

For very exact work, a gauge, plainly marked, should accompany an order.

## INCREASE TWIST DRILLS.



With No. 102 Morse Taper, or No. 103 American Taper, or No. 104 Straight Shafts.

Socket for American Taper	Diameter	Length	Price each	Socket for Morse Taper	Diameter	Length	Price each
No. 1, \$1.30.	1/4	2 1/2	\$0 45	No. 1, \$1.20.	1/4	2 1/2	\$0 45
No. 1, \$1.55.	3/16	2 3/4	50	No. 1, \$1.20.	3/16	2 3/4	50
No. 2, \$1.20.	1/4	2 3/4	53	No. 2, \$1.20.	1/4	2 3/4	53
No. 2, \$1.20.	3/16	2 3/4	55	No. 2, \$1.20.	3/16	2 3/4	55
No. 2, \$1.20.	1/4	2 3/4	58	No. 2, \$1.20.	1/4	2 3/4	58
No. 2, \$1.20.	3/16	2 3/4	60	No. 2, \$1.20.	3/16	2 3/4	60
No. 2, \$1.20.	1/4	2 3/4	65	No. 2, \$1.20.	1/4	2 3/4	65
No. 2, \$1.20.	3/16	2 3/4	68	No. 2, \$1.20.	3/16	2 3/4	68
No. 2, \$1.20.	1/4	2 3/4	70	No. 2, \$1.20.	1/4	2 3/4	70
No. 2, \$1.20.	3/16	2 3/4	75	No. 2, \$1.20.	3/16	2 3/4	75
No. 2, \$1.20.	1/4	2 3/4	80	No. 2, \$1.20.	1/4	2 3/4	80
No. 2, \$1.20.	3/16	2 3/4	85	No. 2, \$1.20.	3/16	2 3/4	85
No. 2, \$1.20.	1/4	2 3/4	90	No. 2, \$1.20.	1/4	2 3/4	90
No. 2, \$1.20.	3/16	2 3/4	95	No. 2, \$1.20.	3/16	2 3/4	95
No. 2, \$1.20.	1/4	2 3/4	100	No. 2, \$1.20.	1/4	2 3/4	100
No. 2, \$1.20.	3/16	2 3/4	110	No. 2, \$1.20.	3/16	2 3/4	110
No. 2, \$1.20.	1/4	2 3/4	120	No. 2, \$1.20.	1/4	2 3/4	120
No. 2, \$1.20.	3/16	2 3/4	130	No. 2, \$1.20.	3/16	2 3/4	130
No. 2, \$1.20.	1/4	2 3/4	140	No. 2, \$1.20.	1/4	2 3/4	140
No. 2, \$1.20.	3/16	2 3/4	150	No. 2, \$1.20.	3/16	2 3/4	150
No. 2, \$1.20.	1/4	2 3/4	160	No. 2, \$1.20.	1/4	2 3/4	160
No. 2, \$1.20.	3/16	2 3/4	170	No. 2, \$1.20.	3/16	2 3/4	170
No. 2, \$1.20.	1/4	2 3/4	185	No. 2, \$1.20.	1/4	2 3/4	185
No. 2, \$1.20.	3/16	2 3/4	190	No. 2, \$1.20.	3/16	2 3/4	190
No. 2, \$1.20.	1/4	2 3/4	205	No. 2, \$1.20.	1/4	2 3/4	205
No. 2, \$1.20.	3/16	2 3/4	215	No. 2, \$1.20.	3/16	2 3/4	215
No. 2, \$1.20.	1/4	2 3/4	230	No. 2, \$1.20.	1/4	2 3/4	230
No. 2, \$1.20.	3/16	2 3/4	245	No. 2, \$1.20.	3/16	2 3/4	245
No. 2, \$1.20.	1/4	2 3/4	260	No. 2, \$1.20.	1/4	2 3/4	260
No. 2, \$1.20.	3/16	2 3/4	275	No. 2, \$1.20.	3/16	2 3/4	275
No. 2, \$1.20.	1/4	2 3/4	290	No. 2, \$1.20.	1/4	2 3/4	290
No. 2, \$1.20.	3/16	2 3/4	300	No. 2, \$1.20.	3/16	2 3/4	300
No. 2, \$1.20.	1/4	2 3/4	320	No. 2, \$1.20.	1/4	2 3/4	320
No. 2, \$1.20.	3/16	2 3/4	340	No. 2, \$1.20.	3/16	2 3/4	340
No. 2, \$1.20.	1/4	2 3/4	360	No. 2, \$1.20.	1/4	2 3/4	360
No. 2, \$1.20.	3/16	2 3/4	380	No. 2, \$1.20.	3/16	2 3/4	380
No. 2, \$1.20.	1/4	2 3/4	400	No. 2, \$1.20.	1/4	2 3/4	400
No. 2, \$1.20.	3/16	2 3/4	420	No. 2, \$1.20.	3/16	2 3/4	420
No. 2, \$1.20.	1/4	2 3/4	440	No. 2, \$1.20.	1/4	2 3/4	440
No. 2, \$1.20.	3/16	2 3/4	460	No. 2, \$1.20.	3/16	2 3/4	460

Sixty-fourth sizes furnished at the price of the next larger size.

## STRAIGHT SHANK MACHINE BITS.

For Wood.



No. 108.

Diam.	Length, Inches	Price each	Diam.	Length, Inches	Price each
1/8	3	\$0 20	1 1/2	6 1/2	\$0 95
1/8	3 1/4	25	1 1/2	6 3/4	1 00
1/8	3 1/2	30	1 1/2	6 1/2	1 15
1/8	3 3/4	35	1 1/2	7	1 35
1/8	4	40	1 1/2	7 1/2	1 65
1/8	4 1/4	45	1 1/2	8	1 95
1/8	4 1/2	50	1 1/2	8 1/2	2 30
1/8	4 3/4	55	1 1/2	9	2 65
1/8	5	65	1 1/2	9 1/2	3 00
1/8	5 1/4	70	1 1/2	11 1/4	3 60
1/8	5 1/2	75	1 1/2	11 3/4	4 00
1/8	5 3/4	80	1 1/2	12	4 40
1/8	6	85	1 1/2	12 1/2	4 80

## BIT STOCK DRILLS.

For Metal or Wood.



No. 109.

Diam-eter	Price per doz.	Price each	Diam-eter	Price per doz.	Price each
1/8	\$1 60	\$0 14	1 1/2	\$8 80	\$0 75
1/8	1 65	16	1 1/2	9 60	82
1/8	2 10	20	1 1/2	10 30	87
1/8	2 60	24	1 1/2	11 00	92
1/8	3 10	29	1 1/2	12 00	1 20
1/8	3 60	33	1 1/2	13 00	1 35
1/8	4 10	38	1 1/2	14 00	1 50
1/8	4 70	43	1 1/2	15 00	1 65
1/8	5 40	48	1 1/2	16 00	1 80
1/8	6 30	54	1 1/2	17 00	1 95
1/8	7 20	62	1 1/2	18 00	2 15
1/8	8 00	68	1 1/2	19 00	2 35

Our bit stock drills will fit any brace in the market, and will drill steel, iron or other metals, as well as wood. They are not injured by contact with screws or nails, and will bore any kind of wood without splitting it.

## WOOD BORING BRACE DRILLS.



The numbers indicate the sizes in 32nds.

Intermediate sizes furnished at the price of next larger number.

No.	Per dozen	Each	No.	Per dozen	Each	No.	Per dozen	Each
2	\$1 60	\$0 15	11	\$4 00	\$0 35	20	\$6 00	\$0 55
3	1 60	15	12	4 00	35	22	6 50	60
4	1 60	15	13	4 50	40	24	7 00	65
5	1 75	18	14	4 50	40	26	7 50	70
6	2 00	20	15	5 00	45	28	8 00	75
7	2 50	22	16	5 00	45	30	9 00	80
8	3 00	25	17	5 50	50	32	10 00	95
9	3 50	30	18	5 50	50			
10	3 50	30	19	6 00	55			

## COE'S DRILLS.



No. 110.

Fitting Coe's Blacksmiths' Drill Press, Prentice Drill Press No. 3, and S. &amp; D. No. 3 Press.

Diam-eter	Length	Price each	Diam-eter	Length	Price each
1/8	4 1/2 in.	\$0 55	1 1/2	6 in.	\$1 40
1/8	5 1/2 in.	58	1 1/2	6 in.	1 45
1/8	6 in.	60	1 1/2	6 in.	1 55
1/8	6 in.	65	1 1/2	6 in.	1 60
1/8	6 in.	70	1 1/2	6 in.	1 70
1/8	6 in.	73	1 1/2	6 in.	1 80
1/8	6 in.	75	1 1/2	6 in.	1 90
1/8	6 in.	80	1 1/2	6 in.	2 00
1/8	6 in.	85	1 1/2	6 in.	2 10
1/8	6 in.	88	1 1/2	6 in.	2 20
1/8	6 in.	90	1 1/2	6 in.	2 25
1/8	6 in.	93	1 1/2	6 in.	2 30
1/8	6 in.	95	1 1/2	6 in.	2 35
1/8	6 in.	98	1 1/2	6 in.	2 40
1/8	6 in.	1 00	1 1/2	6 in.	2 50
1/8	6 in.	1 03	1 1/2	6 in.	2 60
1/8	6 in.	1 05	1 1/2	6 in.	2 70
1/8	6 in.	1 10	1 1/2	6 in.	2 80
1/8	6 in.	1 15	1 1/2	6 in.	2 90
1/8	6 in.	1 20	1 1/2	6 in.	3 00
1/8	6 in.	1 25	1 1/2	6 in.	3 10
1/8	6 in.	1 30	1 1/2	6 in.	3 20
1/8	6 in.	1 35	1 1/2	6 in.	3 20

Shanks on these Drills are 2 1/4 inches long, and about 1/4 inch diameter.

## SILVER &amp; DEMING DRILLS.

Fitting Boynton &amp; Plumer and Silver &amp; Deming Blacksmiths' Drill Presses, Nos. 1 and 2, with Shanks 1/4 inch diameter.

No. 112.



Short Length.

Dia.	Length	Price each	Dia.	L'gth	Price each	Dia.	Length	Price each
1/8	4 1/2 in.	\$0 45	1 1/2	6 in.	\$0 95	1 1/2	6 in.	\$2 00
1/8	4 1/2 in.	48	1 1/2	6 in.	1 05	1 1/2	6 in.	2 10
1/8	5 1/2 in.	50	1 1/2	6 in.	1 10	1 1/2	6 in.	2 20
1/8	5 1/2 in.	55	1 1/2	6 in.	1 15	1 1/2	6 in.	2 25
1/8	6 in.	60	1 1/2	6 in.	1 20	1 1/2	6 in.	2 30
1/8	6 in.	65	1 1/2	6 in.	1 25	1 1/2	6 in.	2 35
1/8	6 in.	70	1 1/2	6 in.	1 30	1 1/2	6 in.	2 40
1/8	6 in.	73	1 1/2	6 in.	1 35	1 1/2	6 in.	2 50
1/8	6 in.	75	1 1/2	6 in.	1 40	1 1/2	6 in.	2 60
1/8	6 in.	78	1 1/2	6 in.	1 45	1 1/2	6 in.	2 70
1/8	6 in.	80	1 1/2	6 in.	1 50	1 1/2	6 in.	2 80
1/8	6 in.	83	1 1/2	6 in.	1 60	1 1/2	6 in.	2 90
1/8	6 in.	85	1 1/2	6 in.	1 70	1 1/2	6 in.	3 00
1/8	6 in.	88	1 1/2	6 in.	1 80	1 1/2	6 in.	3 10
1/8	6 in.	90	1 1/2	6 in.	1 90	1 1/2	6 in.	3 20

The above Drills have Shanks 2 1/4 inches long, and 1/4 inch diameter.

## TAPER REAMERS.



No. 118.

PRICES:

For Reamer, Taper of Morse Drill Socket No. 1	.....	\$2 00
For Reamer, Taper of Morse Drill Socket No. 2	.....	2 60
For Reamer, Taper of Morse Drill Socket No. 3	.....	3 40
For Reamer, Taper of Morse Drill Socket No. 4	.....	4 40
For Reamer, Taper of Morse Drill Socket No. 5	.....	6 60
For Reamer, Taper of Morse Drill Socket No. 6	.....	12 00



## Steel Sockets for Taper Shank Drills.



No. 100. Morse Taper Socket.

	Entire L'ght	Diam. of Blank End	Price
No. 1. Holds $\frac{1}{8}$ to $\frac{1}{4}$ in., inclusive	7 in.	1 $\frac{1}{4}$ in.	\$ 1 20
No. 2. Holds $\frac{1}{4}$ to $\frac{3}{8}$ " "	8 " "	1 $\frac{3}{8}$ " "	1 80
No. 3. Holds $\frac{3}{8}$ to $1\frac{1}{2}$ " "	10 " "	1 $\frac{1}{2}$ " "	2 50
No. 4. Holds $1\frac{1}{2}$ to 2 " "	13 " "	2 " "	4 00
No. 5. Holds $2\frac{1}{2}$ to $3\frac{1}{2}$ " "	15 " "	3 " "	7 50
No. 6. Holds $3\frac{1}{2}$ to 4 " "	18 " "	3 " "	14 00

## No. 101. American Taper Socket.

No. 1. Holds $\frac{1}{8}$ to $\frac{1}{4}$ inch, inclusive	\$1 50
No. 2. Holds $\frac{1}{4}$ to $\frac{3}{8}$ " "	1 55
No. 3. Holds $\frac{3}{8}$ to $\frac{1}{2}$ " "	2 00
No. 4. Holds $\frac{1}{2}$ to $1\frac{1}{4}$ " "	2 50

## Steel Sockets for Morse Taper Shank Drills.



No. 100 A.

No. 1 with Shank fitted to No. 2 or 3 Socket	\$2 00
No. 2 with Shank fitted to No. 3 Socket	2 50
No. 3 with Shank fitted to No. 4 Socket	3 20
No. 4 with Shank fitted to No. 5 Socket	4 80

## Steel Sleeves for Morse Taper Shank Drills.



No. 100 B.

No. 1 fitted to No. 2 or 3 Socket	\$1 80
No. 2 fitted to No. 3 Socket	2 40
No. 3 fitted to No. 4 Socket	3 00
No. 4 fitted to No. 5 Socket	4 40

## ARBORS FOR SHELL REAMERS.



No. 120 J.

No	Price each.	Fitting Sizes.	Full Length	No.	Price each.	Fitting Sizes.	Full Length.
1	\$1 20	$\frac{1}{8}$ to $\frac{1}{4}$ in.	8 in.	8	\$2 70	$\frac{1}{4}$ to $\frac{3}{8}$ in.	12 in.
2	1 40	" " "	9 " "	9	3 00	" " "	13 " "
3	1 60	" " "	10 " "	10	3 40	" " "	14 " "
4	1 80	" " "	11 " "	11	3 80	" " "	15 " "
5	2 00	" " "	12 " "	12	4 20	" " "	16 " "
6	2 20	" " "	13 " "	13	4 60	" " "	17 " "
7	2 40	" " "	14 " "	14	5 00	" " "	18 " "

## SELF-OILING DRILLS

These Drills are specially adapted for use in screw machines and turret lathes, and can be furnished any length required.



Style C.

Diam.	Length, Inches	Price	Diam.	Length, Inches	Price
$\frac{1}{8}$ in.	9	\$2 30	$\frac{1}{2}$ in.	12	\$ 2 90
$\frac{1}{4}$ in.	9	2 40	$\frac{3}{4}$ in.	12	3 00
$\frac{3}{8}$ in.	9	2 50	1 in.	12	3 10
$\frac{1}{2}$ in.	9	2 60	1 $\frac{1}{4}$ in.	12	3 20
$\frac{5}{8}$ in.	9	2 70	1 $\frac{3}{8}$ in.	12	3 30
1 in.	9	2 80	1 $\frac{1}{2}$ in.	12	3 40
1 $\frac{1}{4}$ in.	9	2 90	1 $\frac{3}{4}$ in.	12	3 50
1 $\frac{1}{2}$ in.	9	3 00	2 in.	12	3 60
1 $\frac{3}{4}$ in.	9	3 10	2 $\frac{1}{4}$ in.	12	3 70
2 in.	9	3 20	2 $\frac{3}{4}$ in.	12	3 80
2 $\frac{1}{4}$ in.	9	3 30	3 in.	12	3 90
2 $\frac{3}{4}$ in.	9	3 40	3 $\frac{1}{4}$ in.	12	4 00
3 in.	9	3 50	3 $\frac{3}{4}$ in.	12	4 10
3 $\frac{1}{4}$ in.	9	3 60	4 in.	12	4 25
3 $\frac{3}{4}$ in.	9	3 75	4 $\frac{1}{4}$ in.	12	4 45
4 in.	9	3 90	4 $\frac{3}{4}$ in.	12	4 65
4 $\frac{1}{4}$ in.	9	4 10	5 in.	12	4 85
4 $\frac{3}{4}$ in.	9	4 30	5 $\frac{1}{4}$ in.	12	5 05
5 in.	9	4 45	5 $\frac{3}{4}$ in.	12	5 25
5 $\frac{1}{4}$ in.	9	4 60	6 in.	12	5 50
5 $\frac{3}{4}$ in.	9	4 75	6 $\frac{1}{4}$ in.	12	5 75
6 in.	9	4 95	6 $\frac{3}{4}$ in.	12	6 00
6 $\frac{1}{4}$ in.	9	5 15	7 in.	12	6 25
6 $\frac{3}{4}$ in.	9	5 35	7 $\frac{1}{4}$ in.	12	6 50
7 in.	9	5 65	7 $\frac{3}{4}$ in.	12	6 75
7 $\frac{1}{4}$ in.	9	5 95	8 in.	12	7 00
7 $\frac{3}{4}$ in.	9	6 25	8 $\frac{1}{4}$ in.	12	7 25
8 in.	9	6 55	8 $\frac{3}{4}$ in.	12	7 50
8 $\frac{1}{4}$ in.	9	6 85	9 in.	12	8 00
8 $\frac{3}{4}$ in.	9	7 15	9 $\frac{1}{4}$ in.	12	8 50
9 in.	9	7 50	9 $\frac{3}{4}$ in.	12	9 00
9 $\frac{1}{4}$ in.	9	7 85	10 in.	12	9 50
9 $\frac{3}{4}$ in.	9	8 25	10 $\frac{1}{4}$ in.	12	10 00

TAPER SQUARE SHANK DRILLS  
FITTING RATCHETS.

No. 109 E.

Price, with Shanks  $\frac{3}{8}$  inch by  $\frac{3}{4}$  inch and  $1\frac{1}{4}$  inches long, and Shanks  $\frac{1}{2}$  inch by  $\frac{1}{2}$  inch and  $1\frac{1}{4}$  inches long. Unless size of Shank is stated, we will send Drills with Shanks  $\frac{3}{8}$  x  $\frac{3}{8}$  x  $1\frac{1}{4}$  inches long.

Dia.	Length	Price each	Dia.	Length	Price each	Dia.	Length	Price each
$\frac{1}{8}$ in.	5 in.	\$1 00	$\frac{1}{4}$ in.	6 in.	\$1 45	$\frac{1}{2}$ in.	9 in.	\$ 3 10
$\frac{1}{4}$ in.	5 in.	1 05	$\frac{3}{8}$ in.	6 in.	1 50	$\frac{3}{4}$ in.	9 in.	3 25
$\frac{3}{8}$ in.	5 in.	1 10	$\frac{1}{2}$ in.	6 in.	1 55	1 in.	9 in.	3 35
$\frac{1}{2}$ in.	5 in.	1 15	$\frac{5}{8}$ in.	6 in.	1 65	1 $\frac{1}{4}$ in.	9 in.	3 50
1 in.	5 in.	1 20	7 in.	1 75	1 75	1 $\frac{3}{8}$ in.	9 in.	3 65
$\frac{1}{8}$ in.	6 in.	1 25	7 in.	1 90	1 90	1 $\frac{1}{2}$ in.	9 in.	3 75
$\frac{1}{4}$ in.	6 in.	1 30	7 $\frac{1}{4}$ in.	2 05	2 05	1 $\frac{3}{4}$ in.	9 in.	3 90
$\frac{3}{8}$ in.	6 in.	1 35	7 $\frac{3}{4}$ in.	2 15	2 15	2 in.	9 in.	4 05
$\frac{1}{2}$ in.	6 in.	1 39	8 in.	2 30	2 30	2 $\frac{1}{4}$ in.	10 in.	4 20
$\frac{5}{8}$ in.	6 in.	1 43	8 $\frac{1}{4}$ in.	2 45	2 45	2 $\frac{3}{4}$ in.	10 in.	4 35
1 in.	6 in.	1 45	8 $\frac{3}{4}$ in.	2 55	2 55	3 in.	10 in.	4 50
$\frac{1}{8}$ in.	7 in.	1 40	9 in.	2 70	2 70	3 $\frac{1}{4}$ in.	10 in.	4 65
$\frac{1}{4}$ in.	7 in.	1 40	9 $\frac{1}{4}$ in.	2 85	2 85	3 $\frac{3}{4}$ in.	10 in.	4 80
$\frac{3}{8}$ in.	7 in.	1 45	9 $\frac{3}{4}$ in.	3 00	3 00			

**SOLID REAMERS.**  
**JOBBER'S SET.**


No. 115.

Diameter	Price Each	Full Length	Length of Flute	Diameter	Price Each	Full Length	Length of Flute
1/8	\$1 00	3	1 1/2	1 1/2	\$5 40	12 1/2	6 1/2
1/4	1 10	3 1/4	1 3/8	1 3/4	5 60	12 3/4	6 3/4
3/8	1 20	3 1/2	1 3/4	1 7/8	5 80	12 5/8	6 5/8
1/2	1 30	3 3/4	1 3/4	2	6 00	12 3/4	6 3/4
5/8	1 40	4	2	2 1/8	6 20	12 5/8	6 5/8
3/4	1 45	4 1/4	2 1/8	2 1/4	6 40	12 3/4	6 3/4
7/8	1 50	4 1/2	2 1/4	2 3/8	6 60	13	6 1/2
1	1 55	4 3/4	2 1/2	2 1/2	6 80	13	6 1/2
1 1/8	1 60	5	2 1/2	2 3/4	7 00	13	6 1/2
1 1/4	1 70	5 1/4	2 3/8	2 7/8	7 20	13	6 1/2
1 1/2	1 75	5 1/2	2 3/4	3	7 40	13 1/2	6 3/4
1 3/4	1 85	5 3/4	2 3/4	3 1/8	7 60	13 1/4	6 3/4
1 7/8	1 90	6	3	3 1/4	7 80	13 1/2	6 3/4
2	1 95	6 1/4	3 1/8	3 1/2	8 00	13 1/4	6 3/4
2 1/8	2 00	6 1/2	3 1/4	3 3/8	8 20	13 1/2	6 3/4
2 1/4	2 10	6 3/4	3 1/2	3 1/2	8 40	13 1/4	6 3/4
2 3/8	2 20	7	3 1/2	3 3/4	8 60	13 1/2	6 3/4
2 1/2	2 30	7 1/4	3 3/8	3 7/8	8 80	14	7
2 3/4	2 40	7 1/2	3 3/4	4	9 00	14	7
2 7/8	2 50	8	3 3/4	4 1/8	9 20	14	7
3	2 60	8 1/4	4	4 1/4	9 40	14	7
3 1/8	2 70	8 1/2	4 1/8	4 1/2	9 60	14	7
3 1/4	2 80	9	4 1/4	4 3/8	10 00	14 1/2	7 1/4
3 1/2	2 95	9 1/4	4 1/2	4 1/2	10 40	14 1/2	7 1/4
3 3/4	3 10	9 1/2	4 3/4	4 3/4	10 80	15	7 1/2
4	3 25	10	5	4 3/8	11 30	15	7 1/2
4 1/8	3 40	10 1/4	5 1/8	4 1/2	11 80	15	7 1/2
4 1/4	3 55	10 1/2	5 1/4	4 3/4	12 30	15 1/2	7 3/4
4 1/2	3 70	10 3/4	5 1/2	4 7/8	12 80	15 1/2	7 3/4
4 3/4	3 85	11 1/4	5 1/2	5	13 40	15 1/2	7 3/4
4 7/8	4 00	11 1/2	5 3/8	5 1/8	14 00	15 1/2	7 3/4
5	4 15	11 3/4	5 3/4	5 1/4	14 60	16	8
5 1/8	4 30	11 3/8	5 3/4	5 1/2	15 40	16	8
5 1/4	4 45	11 1/2	5 3/4	5 3/4	16 20	16	8
5 1/2	4 60	12	6	5 1/2	17 00	16 1/2	8 1/4
5 3/4	4 75	12 1/4	6 1/4	5 3/4	17 80	16 1/2	8 1/4
6	4 90	12 1/2	6 1/2	6	18 60	16 1/2	8 1/4
6 1/8	5 05	12 3/4	6 1 1/2	6 1/8	19 40	16 1/2	8 1/4
6 1/4	5 20	12 3/8	6 1 1/2	6 1/4			

**SHELL REAMERS.**      **ROSE SHELL REAMERS.**

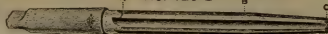

No. 117.

No. 117 A.

Diameter, inches.	Length, inches.	Size Hole, inches.	Price, Each.	Diameter, inches.	Length, inches.	Size Hole, inches.	Price, Each.
1/8	1 1/4	1/8	\$1 10	1 1/2	4	1 1/2	\$7 60
1/4	1 1/2	1/4	1 10	1 3/4	4	1 3/4	8 00
3/8	1 3/4	3/8	1 20	2	4	2	8 40
1/2	1 5/8	1/2	1 30	2 1/8	4	2 1/8	8 80
5/8	2	5/8	1 40	2 1/4	4	2 1/4	9 20
3/4	2 1/4	3/4	1 50	2 3/8	4	2 3/8	9 60
7/8	2 1/2	7/8	1 60	2 1/2	4 1/2	2 1/2	9 90
1	2 3/4	1	1 60	2 3/4	4 1/2	2 3/4	10 20
1 1/8	2 3/8	1 1/8	1 60	2 7/8	4 1/2	2 7/8	10 60
1 1/4	2 3/8	1 1/4	1 70	3	4 1/2	3	11 00
1 1/2	2 3/8	1 1/2	1 70	3 1/8	4 1/2	3 1/8	12 00
1 3/4	2 3/8	1 3/4	1 80	3 1/4	4 1/2	3 1/4	12 50
1 7/8	2 3/8	1 7/8	1 80	3 3/8	4 1/2	3 3/8	13 00
2	2 3/8	2	1 90	3 1/2	5	3 1/2	13 50
2 1/8	2 3/8	2 1/8	2 00	3 3/4	5	3 3/4	14 00
2 1/4	2 3/8	2 1/4	2 20	4	5	4	14 50
2 3/8	2 3/8	2 3/8	2 40	4 1/8	5	4 1/8	15 00
2 1/2	2 3/8	2 1/2	2 60	4 1/4	5	4 1/4	15 50
2 3/4	2 3/8	2 3/4	2 80	4 3/8	5	4 3/8	16 00
3	2 3/8	3	3 00	4 1/2	5	4 1/2	17 00
3 1/8	2 3/8	3 1/8	3 20	4 3/4	5	4 3/4	18 00
3 1/4	2 3/8	3 1/4	3 50	5	5	5	18 30
3 3/8	2 3/8	3 3/8	3 80	5 1/8	5	5 1/8	18 60
3 1/2	2 3/8	3 1/2	4 10	5 1/4	5	5 1/4	19 00
3 3/4	2 3/8	3 3/4	4 40	5 1/2	5	5 1/2	19 40
4	2 3/8	4	4 70	5 3/8	5	5 3/8	19 80
4 1/8	2 3/8	4 1/8	5 00	5 1/2	5 1/2	5 1/2	20 20
4 1/4	2 3/8	4 1/4	5 20	5 3/4	5 1/2	5 3/4	20 60
4 1/2	2 3/8	4 1/2	5 40	6	5 1/2	6	21 00
4 3/4	2 3/8	4 3/4	5 60	6 1/8	6	6 1/8	21 60
4 7/8	2 3/8	4 7/8	5 80	6 1/4	6	6 1/4	22 20
5	2 3/8	5	6 00	6 1/2	6	6 1/2	22 80
5 1/8	2 3/8	5 1/8	6 20	6 3/8	6	6 3/8	23 40
5 1/4	2 3/8	5 1/4	6 40	6 1/2	6	6 1/2	24 00
5 1/2	2 3/8	5 1/2	6 60	6 3/4	6	6 3/4	24 60
5 3/4	2 3/8	5 3/4	6 80	6 7/8	6	6 7/8	25 20
6	2 3/8	6	7 00	7	6	7	26 00
6 1/8	2 3/8	6 1/8	7 20				

**AIR DRILL REAMERS for Boiler Makers, Bridge and Ship Builders.**

No. 120 L



These Reamers are made with five flutes and from the best material. While plainly finished, they are sufficiently accurate for the purpose intended.

Diameter at			Price	No of Taper Shank	Length Over All	Length of Flute
A	B	C				
1/2 in.	1/2 in.	1/2 in.	\$2 75	No. 2	9 in.	5 1/4 in.
5/8	5/8	5/8	2 80	" 2	10 "	5 1/2
3/4	3/4	3/4	3 00	" 3	11 "	6 1/4
7/8	7/8	7/8	3 10	" 3	12 "	7 1/8
1	1	1	3 30	" 3	12 "	7 3/8
1 1/8	1 1/8	1 1/8	3 50	" 3	12 "	7 5/8
1 1/4	1 1/4	1 1/4	3 70	" 3	12 "	7 7/8
1 1/2	1 1/2	1 1/2	3 90	" 3	12 "	7 9/8
1 3/4	1 3/4	1 3/4	4 10	" 3	12 "	7 11/8
1 7/8	1 7/8	1 7/8	4 30	" 3	12 "	7 13/8
2	2	2	4 50	" 3	12 "	7 15/8

## MACHINISTS, HAND TAPS.



Taper.



Plug.



Bottoming.

Sizes, In.	Plate and Hand Taps Taper, Plug or Bottoming.	Number of Threads to inch.	Sizes, In.	Plate and Hand Taps Taper, Plug or Bottoming.	Number of Threads to inch.
$\frac{3}{16}$	\$0 45	24	$1\frac{1}{4}$	\$5 00	5
$\frac{1}{4}$	45	16, 18, 20	$1\frac{1}{2}$	5 80	$4\frac{1}{2}$ , 5
$\frac{5}{16}$	50	16, 18	2	6 70	$4\frac{1}{2}$ , 5
$\frac{3}{8}$	55	14, 16, 18	$2\frac{1}{2}$	8 00	$4\frac{1}{2}$ , 5
$\frac{7}{16}$	60	12, 14, 16	$2\frac{1}{2}$	9 20	$4\frac{1}{2}$ , 5
$\frac{1}{2}$	70	12, 13, 14	$2\frac{3}{4}$	10 50	$4\frac{1}{2}$ , 5
$\frac{9}{16}$	80	12, 14	$2\frac{3}{4}$	11 50	4
$\frac{5}{8}$	90	10, 11, 12	$2\frac{3}{4}$	13 00	4
$1$	1 05	11, 12	$2\frac{3}{4}$	14 00	4
$1\frac{1}{16}$	1 20	10, 12	$2\frac{3}{4}$	15 50	4
$1\frac{1}{8}$	1 40	10	3	17 00	$3\frac{1}{2}$
$1\frac{3}{8}$	1 60	9, 10	$3\frac{1}{8}$	18 75	$3\frac{1}{2}$
$1\frac{1}{2}$	1 80	9	$3\frac{1}{4}$	20 50	$3\frac{1}{2}$
$1\frac{5}{8}$	2 00	8	$3\frac{3}{8}$	22 00	$3\frac{1}{2}$
$1\frac{3}{4}$	2 25	7, 8	$3\frac{1}{2}$	24 00	$3\frac{1}{2}$
$1\frac{7}{8}$	2 60	7	$3\frac{3}{4}$	26 00	$3\frac{1}{2}$
$1\frac{9}{8}$	3 00	6	$3\frac{7}{8}$	28 50	3
$1\frac{11}{8}$	3 50	6	4	30 00	3
$1\frac{13}{8}$	4 20	5, 5 $\frac{1}{2}$	4	32 50	3

Exact sizes, with threads indicated by the heavy type, V form, will be sent, unless otherwise ordered.

## MACHINE NUT TAPS.

Sizes.	Price each.	No. of Threads to inch.	Whole Length, In.
$\frac{3}{16}$	\$0 60	24	4
$\frac{1}{4}$	60	16, 18, 20	$4\frac{1}{2}$
$\frac{5}{16}$	70	16, 18	$5\frac{1}{8}$
$\frac{3}{8}$	80	14, 16	$5\frac{1}{4}$
$\frac{7}{16}$	90	12, 14, 16	$6\frac{3}{8}$
$\frac{1}{2}$	1 00	12, 13, 14	7
$\frac{9}{16}$	1 15	12, 14	$7\frac{3}{4}$
$\frac{5}{8}$	1 30	10, 11, 12	$8\frac{1}{2}$
$\frac{11}{16}$	1 45	11, 12	$9\frac{1}{4}$
$\frac{3}{4}$	1 60	10	$9\frac{1}{2}$
$\frac{7}{8}$	1 80	10	10
$1$	2 10	9, 10	10
$1\frac{1}{8}$	2 40	9	11
$1\frac{1}{4}$	2 80	8	11
$1\frac{1}{2}$	3 20	7, 8	13
$1\frac{3}{4}$	3 70	7, 8	13
$1\frac{1}{2}$	4 20	6	14
$1\frac{5}{8}$	4 70	6	14
$1\frac{3}{4}$	5 30	5, 5 $\frac{1}{2}$	$14\frac{1}{2}$
$1\frac{7}{8}$	6 00	5	$15\frac{1}{2}$
$1\frac{9}{8}$	6 80	$4\frac{1}{2}$ , 5	$16\frac{1}{4}$
$1\frac{11}{8}$	7 70	$4\frac{1}{2}$ , 5	17
$1\frac{13}{8}$	9 00	$4\frac{1}{2}$ , 5	18
$1\frac{15}{8}$	10 20	$4\frac{1}{2}$ , 5	18
$1\frac{17}{8}$	11 50	$4\frac{1}{2}$ , 5	19
$1\frac{19}{8}$	12 50	4	19
$1\frac{21}{8}$	14 00	4	$19\frac{1}{2}$
$1\frac{23}{8}$	15 00	4	$19\frac{1}{2}$
$1\frac{25}{8}$	16 50	4	21
$1\frac{27}{8}$	18 00	$3\frac{1}{2}$	21
$1\frac{29}{8}$	19 75	$3\frac{1}{2}$	21
$1\frac{31}{8}$	21 50	$3\frac{1}{2}$	21
$1\frac{33}{8}$	23 00	$3\frac{1}{2}$	21
$1\frac{35}{8}$	25 00	$3\frac{1}{2}$	21
$1\frac{37}{8}$	27 00	$3\frac{1}{2}$	21
$1\frac{39}{8}$	29 50	3	21
$1\frac{41}{8}$	31 00	3	21
$1\frac{43}{8}$	33 50	3	21

These will be sent 1-32 oversize, with threads indicated by the heavy type, V form, unless otherwise ordered.

## TAPS FOR MACHINE SCREWS.



Made of best steel, well tempered, accurately cut and finished. Less than six of one size will be charged as single taps.

Approximate Diameter. Fractions of an inch.	Wire Gauge No.	Number of threads to inch.	Price each.	Price per dozen.	Approximate Diameter. Fractions of an inch.	Wire Gauge No.	Number of threads to inch.	Price each.	Price per dozen.
..	1	60, 72	\$0 35	\$4 00	..	13	20, 24	\$0 38	\$4 40
..	2	48, 56, 64	35	4 00	..	14	16, 18, 20, 22, 24	38	4 40
..	3	40, 48, 56	35	4 00	..	15	18, 20, 24	38	4 40
$\frac{1}{16}$	4	32, 36, 40	35	4 00	$\frac{1}{16}$	16	16, 18, 20, 22	38	4 40
$\frac{1}{8}$	5	30, 32, 36, 40	35	4 00	$\frac{1}{8}$	18	16, 18, 20	38	4 40
$\frac{3}{16}$	6	30, 32, 36, 40	35	4 00	$\frac{3}{16}$	19	16, 18, 20	38	4 40
$\frac{1}{4}$	7	24, 30, 32	35	4 00	$\frac{1}{4}$	20	16, 18, 20	45	5 30
$\frac{5}{16}$	8	24, 30, 32, 36, 40	35	4 00	$\frac{5}{16}$	22	16, 18	45	5 30
$\frac{3}{8}$	9	24, 28, 30, 32	35	4 00	$\frac{3}{8}$	24	14, 16, 18	45	5 30
$\frac{7}{16}$	10	20, 22, 24, 30, 32	35	4 00	..	26	16	53	6 30
$\frac{1}{2}$	11	22, 24	35	4 00	..	28	16	53	6 30
$\frac{9}{16}$	12	20, 22, 24	35	4 00	..	30	16	53	6 30

When so ordered, the taps will be furnished in sets of taper, plug and bottoming forms, like hand taps. Shanks on No. 1 to 5 are  $\frac{1}{4}$  inch diameter. Shanks on No. 6 to No. 30 are equal to diameter of outside of thread.

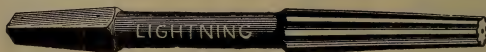
**MACHINISTS' HAND TAPS.****TAPER, PLUG AND BOTTOMING.****TAPER TAP.**

Sizes.	Price Each.	No. of Threads.	Sizes.	Price Each.	No. of Threads.	Sizes.	Price Each.	No. of Threads.
3-16	\$0 35	24	9-16	\$0 80	12, 14	15-16	\$1 80	9
1-4	45	16, 18, 20	5-8	90	10, 11, 12	1	2 00	8
5-16	50	16, 18	11-16	1 05	11, 12	1 1-8	2 25	7, 8
3-8	55	14, 16, 18	3-4	1 20	10, 12	1 1-4	2 60	
7-16	60	12, 14, 16	13-16	1 40	10	1 3-8	3 00	6
1-2	70	12, 13, 14	7-8	1 60	9, 10	1 1-2	3 50	6

*Exact sizes, with threads indicated by the heavy type, V form, will be sent, unless otherwise ordered.*

**MACHINE SCREW TAPS.**

Screw Gauge Sizes.	Prices.		Number of Threads to Inch.	Screw Gauge Sizes.	Prices.		Number of Threads to Inch.
	Each.	Per Doz.			Each.	Per Doz.	
No. 4	\$0 35	\$4 00	32, 36, 40	No. 14	\$0 38	\$4 40	20, 24
" 6	35	4 00	30, 32	" 16	38	4 40	16, 18, 20
" 8	35	4 00	24, 30, 32	" 18	38	4 40	16, 18
" 10	35	4 00	24, 30, 32	" 20	45	5 30	16, 18
" 12	35	4 00	20, 24	" 24	45	5 30	16, 18

**TAPER REAMERS FOR BIT BRACE.**

Sizes, Prices,	1-4 \$0 45	5-16 50	3-8 55	7-16 60	1-2 70	9-16 80	5-8 90	11-16 1 05
Sizes, Prices,	3-4 \$1 20	13-16 1 40	7-8 1 60	15-16 1 80	1 2 00	1 1-8 2 25	1 1-4 2 60	



## PIPE TAPS AND REAMERS.



Pipe taps with right or left-hand threads, and reamers having taper  $\frac{3}{4}$  inch per foot; also straight (called plug) pipe taps, are made of the following sizes, and kept in stock:

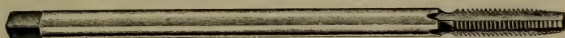
Size	Price Each	Reamer Diam. at $\frac{3}{4}$ in. from Point	Size	Price Each	Reamer Diam. at $\frac{3}{4}$ in. from Point	Size	Price Each	Reamer Diam. at $\frac{3}{4}$ in. from Point
$\frac{1}{8}$	\$1 12	$\frac{11}{16}$	1	\$3 12	$1\frac{1}{2}$	$2\frac{1}{2}$	\$10 50	$2\frac{3}{4}$
$\frac{1}{4}$	1 25	$\frac{1}{2}$	$1\frac{1}{4}$	3 75	$1\frac{7}{8}$	3	15 00	$3\frac{1}{4}$
$\frac{3}{8}$	1 50	$\frac{7}{8}$	$1\frac{1}{2}$	4 62	$1\frac{3}{4}$	$3\frac{1}{2}$	22 00	$3\frac{3}{4}$
$\frac{1}{2}$	1 87	$1$	2	6 25	$2\frac{1}{8}$	4	33 00	$4\frac{1}{4}$
$\frac{3}{4}$	2 50	$1\frac{1}{4}$			$2\frac{1}{2}$			

## TAPPER TAPS.



Diameter, Inches	No. of Threads to Inch.	Length of Thread in Inches.	PRICE EACH, WHOLE LENGTH		
			11 Inches	12 Inches	14 Inches
$\frac{1}{4}$	18, 20	$1\frac{1}{2}$	\$0 70	\$0 75	\$0 80
$\frac{1}{8}$	16, 18	$1\frac{1}{4}$	80	85	90
$\frac{3}{8}$	14, 16	2	90	95	1 00
$\frac{1}{2}$	12, 14, 16	2	1 00	1 05	1 15
$\frac{3}{4}$	12, 13, 14	$2\frac{1}{4}$	1 12	1 15	1 25
$\frac{1}{2}$	12, 14	$2\frac{1}{4}$	1 30	1 35	1 45
$\frac{3}{8}$	10, 11, 12	$2\frac{1}{2}$	1 45	1 50	1 65
$\frac{1}{4}$	11, 12	$2\frac{1}{2}$	1 62	1 70	1 80
$\frac{3}{8}$		$2\frac{1}{2}$	1 80	1 85	2 00
$\frac{1}{2}$		$2\frac{1}{2}$	2 05	2 10	2 25
$\frac{3}{4}$		$2\frac{1}{2}$	2 35	2 45	2 60
$\frac{1}{2}$	9	$2\frac{1}{2}$	2 70	2 75	3 00
$\frac{3}{8}$	8	$2\frac{1}{2}$	3 15	3 20	3 50

## PULLEY TAPS.



Sizes	No. of Threads to Inch	PRICE, EACH									
		6 Inches	8 Inches	10 Inches	12 Inches	14 Inches	16 Inches	18 Inches	20 Inches	22 Inches	24 Inches
$\frac{3}{8}$	14, 16	\$0 80	\$0 90	\$1 10	\$1 30	\$1 40	\$1 60	\$1 80	.....	.....	.....
$\frac{1}{2}$	14, 16	90	1 00	1 20	1 40	1 50	1 70	1 90	.....	.....	.....
$\frac{3}{4}$	12, 13	1 00	1 30	1 40	1 50	1 60	1 80	2 00	\$2 20	.....	.....
$\frac{1}{2}$	12, 13	1 10	1 35	1 45	1 55	1 70	1 85	2 10	2 30	\$2 50	.....
$\frac{3}{8}$	10, 11	1 20	1 40	1 50	1 60	1 75	1 90	2 20	2 40	2 60	\$2 80
$\frac{1}{4}$	10, 11	.....	1 50	1 55	1 70	2 00	2 10	2 30	2 50	2 70	2 90
$\frac{3}{8}$	10	.....	.....	1 60	1 80	2 10	2 30	2 50	2 70	2 90	3 10
$\frac{1}{2}$	10	.....	.....	1 80	2 00	2 30	2 50	2 70	2 90	3 10	3 30
$\frac{3}{4}$	9, 10	.....	.....	2 10	2 30	2 50	2 70	2 90	3 10	3 30	3 50
$\frac{1}{2}$	9, 10	.....	.....	2 40	2 55	2 70	2 90	3 10	3 30	3 50	3 70
$\frac{3}{8}$	8	.....	.....	2 80	3 00	3 20	3 40	3 60	3 80	4 00	4 20

These will be sent *exact* sizes, "V" form of thread. Other sizes and threads furnished at special prices. U. S. S. form of thread of regular pitch, furnished at same list prices. When ordering give length over all.

## THE "GREEN RIVER" SCREW PLATES.



- Fig. 100. Set No. 1, 5 sizes, 3-16, 1-4, 5-16, 3-8, 7-16 inch, with Stock and Brace Holder, Complete, in case..... \$8.75
- Fig. 122. Set No. 1, as above, with Adjustable Tap Wrench No. 2..... \$11.10
- Single Dies for No. 1 Set..... \$1.00. Guides..... 20 cents
- Diameter of Dies in this set, 1 5-16 inches
- Fig. 101. Set No. 1 1-4, 6 sizes, 3-16, 1-4, 5-16, 3-8, 7-16, 1-2 inch. Complete, in case..... \$11.00
- Diameter of Dies in this Set, 2 3-16 inches.
- Fig. 102. Set No. 1 1-4, as above, with Adjustable Tap Wrench No. 2..... \$13.35
- Fig. 103. Set No. 1 1-2, 7 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4 inch. Complete, in case..... \$13.00
- Diameter of Dies in this Set, 2 3-16 inches.
- Fig. 104. Set No. 1 1-2, as above, with Adjustable Tap Wrench No. 3. Complete, in case..... \$16.00
- Fig. 109. Set No. 4, 7 sizes, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch. Complete, in case, \$20.00
- Diameter of Dies in this Set, 2 3-4 inches.
- Fig. 110. Set No. 4, as above, with Adjustable Tap Wrench No. 4. Complete, in case..... \$24.00
- Fig. 111. Set No. 5, 9 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch. Complete in case..... \$23.00
- Diameter of Dies in this Set, 2 3-4 inches.
- Fig. 112. Set No. 5, as above, with Adjustable Tap Wrenches, Nos. 2 and 4..... \$29.35
- Fig. 115. Set No. 8, 11 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4 inch. Complete, in case..... \$34.00
- Diameter of Dies in this Set, 2 3-4 inches.
- Fig. 116. Set No. 9, 6 sizes, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch. Complete, in case..... \$40.00
- Diameter of Dies in this Set, 3 7-16 inches.
- Fig. 117. Set No. 13, 9 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch. Two Stocks. Complete, in case..... \$25.00
- Diameter of Dies in this Set, 1-2 inch and under, 2 3-16 inches.
- Diameter of Dies in this Set, 5-8 inch and over, 2 3-4 inches.
- Fig. 118. Set No. 13, as above, with Adjustable Tap Wrenches Nos. 2 and 4..... \$31.35
- Fig. 119. Set No. 16, 11 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4 inch. Two Stocks. Complete, in case..... \$36.00
- Diameter of Dies in this Set, 1-2 inch and under, 2 3-16 inches.
- Diameter of Dies in this Set, 5-8 inch and over, 2 3-4 inches.
- Fig. 120. Set No. 25, 13 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch. Two Stocks. Complete, in case..... \$53.00
- Diameter of Dies in this Set, 3-4 inch and under, 2 3-16 inches.
- Diameter of Dies in this Set, 7-8 inch and over, 3 7-16 inches.

*Above Sets sent 1-32 over-size, V Thread, unless otherwise ordered. V Thread, exact size, United States Standard or Whitworth (English) Standard supplied at same price if ordered.*

**NEW FULL-MOUNTED LIGHTNING SCREW PLATE.**

(A STOCK TO EACH DIE.)



- Fig. 216. 3-16 to 1-2 inch, 6 sizes, 3-16, 1-4, 5-16, 3-8, 7-16, 1-2 inch. Complete in case .....\$12.00
- Fig. 217. Same as Fig. 216, but with Adjustable Tap Wrench No. 2.....\$14.35
- Fig. 218. 1-4 to 3-4 inch, 5 sizes, 1-4, 3-8, 1-2, 5-8, 3-4 inch. Complete in case..\$12.50
- Fig. 219. Same as Fig. 218, but with Adjustable Tap Wrench No. 3.....\$15.50
- Fig. 222. Set BB, 1-4 to 3-4 inch, 7 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4 inch. Complete in case.....\$16.00
- Fig. 223. Set BB, as above, with Adjustable Tap Wrench No. 3. Complete in case.....\$19.00
- Fig. 224. Set CE, 1-2 to 1 inch, 5 sizes, 1-2, 5-8, 3-4, 7-8, 1 inch. Complete in case.....\$18.50
- Fig. 225. Set CE, as above with Adjustable Tap Wrench No. 4. Complete in case.....\$22.50
- Fig. 226. Set CC, 3-8 to 1 inch, 7 sizes, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch. Complete in case.....\$22.00
- Fig. 227. Set CC, as above, with Adjustable Tap Wrench No. 4. Complete in case.....\$26.00
- Fig. 228. Set CCC, 1-4 to 1 inch, 9 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch. Complete in case.....\$25.50
- Fig. 229. Set CCC, as above, with Adjustable Tap Wrenches Nos. 2 and 4. Complete in case.....\$31.85
- Fig. 230. 1-2 to 1 1-4 inch, 7 sizes, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4 inch. Complete in case.....\$34.75
- Fig. 231. Same sizes as Fig. 230, but with case holding sizes 1 inch and under only (1 1-8 and 1 1-4 inch not being held in the case). Price.....\$31.50
- Fig. 232. 3-8 to 1 1-4 inch, 9 sizes, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4 inch. Complete in case.....\$37.50
- Fig. 233. Same sizes as Fig. 232, but with case holding sizes 1 inch and under only (1 1-8 and 1 1-4 inch not being held in the case). Price.....\$35.00
- Fig. 234. 1-4 to 1 1-4 inch, 11 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4 inch. Complete in case.....\$41.00
- Fig. 235. Same sizes as in Fig. 234, but with case holding sizes 1 inch and under only (1 1-8 and 1 1-4 inch not being held in the case). Price.....\$38.50
- Fig. 236. 7-8 to 1 1-2 inch, 6 sizes, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch. Complete in case.....\$45.00
- Fig. 237. Same as above without case. Price.....\$39.50
- Fig. 238. 1-4 to 1 1-2 inch, 13 sizes, 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch. Complete in case.....\$60.00
- Fig. 239. Same sizes as Fig. 238, but with case holding sizes 1 inch and under only (sizes 1 1-8 to 1 1-2 not being held in the case). Price.....\$55.75

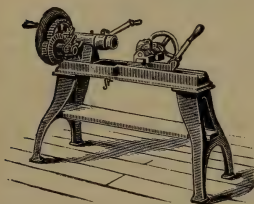
*Above sets sent 1-32 oversize, V thread, unless otherwise ordered.*

**"GREEN RIVER" ADJUSTABLE TAP AND REAMER WRENCHES.**

Jaws of fine tool steel, stock drop forged, handles hollow. The whole thoroughly made, true, strong and durable.



- Fig. 335. Size No. 1, length 7 inches, for Hand Taps 1-4 inch and smaller.....\$1.75  
 Fig. 336. Size No. 2, length 11 inches, for Hand Taps 3-16 to 1-2 inch inclusive...\$2.35  
 Fig. 337. Size No. 3, length 16 inches, for Hand Taps 1-4 to 3-4 inch inclusive....\$3.00  
 Fig. 338. Size No. 4, length 21 inches, for Hand Taps 3-8 to 1 inch inclusive.....\$4.00  
 Fig. 339. Size No. 5, length 34 inches, for Hand Taps 7-8 to 1 1-2 inch inclusive...\$8.00

**"GREEN RIVER" HAND AND POWER BOLT CUTTING, NUT TAPPING, AND PIPE THREADING MACHINES.**

NO. 10, MOUNTED.

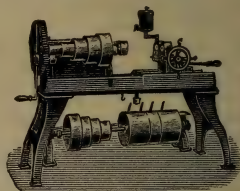
Fig. 754. No. 20 for Bench. Complete with sizes 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, and Tap Chuck.....\$70.00

Fig. 755. No. 20 Mounted. Complete with sizes 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1 inch and Tap Chuck.....\$77.00

Fig. 758. No. 10 for Bench. Complete with sizes 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch and Tap Chuck.....\$137.50

Fig. 759. No. 10 Mounted. Complete with sizes 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inch and Tap Chuck.....\$145.00

Lightning Adjustable Pipe Dies and Collets for No. 10 Machines, 1-8 to 2 inch extra.....\$30.00



NO. 42.

No. 42. Machine complete, with Chuck and Wrenches and Plain Countershaft, having tight and loose pulleys 12 inches in diameter, and Taps, Dies and Collets for bolts and nuts 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8 and 1 1-2 inches....\$164.00

No. 42. Machine with 11 sizes, 1-4 to 1 1-4 inch.....\$150.00

No. 42. Machine with 9 sizes, 1-4 to 1 inch.....\$137.50

No. 48. Machine complete, with Chuck and Wrenches and Plain Countershaft, having tight and loose pulleys 12 inches in diameter, and Taps, Dies and Collets for bolts and nuts 1-4, 5-16, 3-8, 7-16, 1-2, 5-8, 3-4, 7-8, 1, 1 1-8, 1 1-4, 1 3-8, 1 1-2 inches.....\$190.00

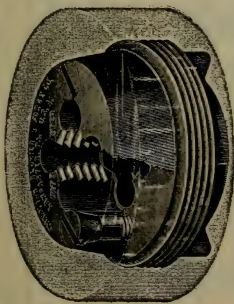
Extra for 1 3-4 inch size.....\$12.00

Extra for 2 inch size.....\$14.50

Extra for set Lightning Adjustable Pipe Dies and Collets for both No. 42 and No. 48 machines, 1-8 to 2 inch.....\$30.00



# THE CHAMPION ELECTRIC DIE AND COLLET.

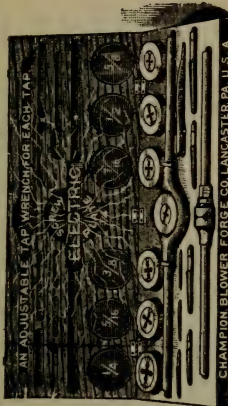


This cut represents the Electric Taper Adjustable Die as held in the Collet, its superior merit in adjustment, accuracy and strength being in the cut visible through the Collet. The Die is shown exactly as when ready for work, screwed into the exact counter taper of the Collet, both tapers matching precisely, the result being a rigidity and firmness on the full circle not to be obtained in any other way. No screws through Collet, consequently there is no impairment of its strength. One screw adjusting movement brings both halves of the Die to centre, assuring absolutely equal work for the cutters, a principle which makes the durability of the Die apparent to everybody. Its simple adjusting principle makes it an efficient tool, even in the hands of people who are not practical mechanics. This form of adjustment is used on both the Electric and Electric Full Mounted Sets. Other superior points are as follows:

1st. The adjustment is entirely universal, impossible to make one cutter cut more than another, thus absolutely assuring a perfect thread. 2d. The adjustment of our Die and Collet can be varied from  $\frac{1}{16}$  of an inch to meet the variations of wrought iron, or to allow nuts and bolts to be made to fit together tightly and loosely as may be desired by simply setting the taper screws to size wanted, and then placing the wrench in the notches purposely made for this in guide, and with one simple turn the Die is universally sent home, where it is placed as solid and firm as though made from one piece of steel. 3d. As our Dies are absolutely firm by being held to the guide by the taper of the Die and Collet, and also the two taper screws, making it entirely impossible for cuttings or any waste material to get underneath the Dies to cock them up and strip the threads, which is a serious point commonly known in other Screw Plates. 4th. It finishes the work at one cut. 5th. For cutting up close to a shoulder use face side of Die downward.

# THE CHAMPION ELECTRIC SCREW PLATE.

NOTICE—Every Set Supplied with Our Patent Adjustable Electric Tap Wrench.  
All Our Taps are Machine-Relieved.



CHAMPION BLOWER FORCE CO. LANCASTER PA. U.S.A.	
No. 1, Plate Complete in Box. Length of stock, 18 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	\$12.00
No. 2, Plate Complete in Box. Length of stock, 23 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	13.50
No. 3, Plate Complete in Box. Length of stock, 29 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	15.00
No. 4, Plate Complete in Box. Length of stock, 29 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	17.50
No. 5, Plate Complete in Box. Length of stock, 23 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	16.00
No. 5½, Plate Complete in Box. Length of stock, 23 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	18.50
No. 6, Plate Complete in Box. Length of stock, 29 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	22.00
No. 7, Plate Complete in Box. Length of stock 29 inches. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	25.50
No. 8, Plate Complete in Box. Has two stocks, 18 inches long for first four sizes, 26 inches long for the larger sizes. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	18.00
No. 9, Plate Complete in Box. Has stocks same as No. 8. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	27.50
No. 9½, Plate Complete in Box. Has stocks same as No. 8. Cutting $\frac{1}{80}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ , $\frac{3}{4}$ , $1\frac{1}{2}$ .	30.00

Unless otherwise specified, all Screw Plates are  $\frac{1}{2}$  oversize V thread. Can supply Screw Plates with exact sizes V or S Standard of Franklin Institute and White P. S.  $\frac{1}{2}$  Die Collet, Guide and Tap furnished with any of the above sets \$2.10.

ALL OUR PLATES WARRANTED.

## THE CHAMPION ELECTRIC MACHINISTS' SCREW PLATE SETS.

With Taper, Plugs and Bottoming Taps.

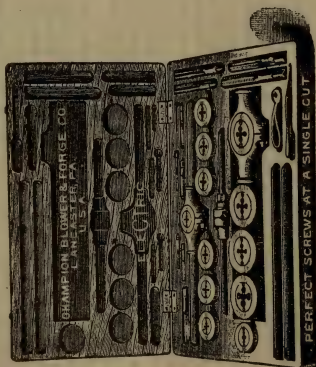
All Sets Furnished with No. 2 Electric Tap Wrench. Illustrated on Page 132.

All Sets Furnished with No. 2 Electric Tap Wrench. Illustrated on Page 132.

## THE CHAMPION ELECTRIC SCREW PLATE ASSORTMENTS.

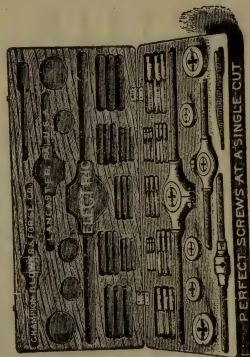
From  $\frac{1}{4}$  to  $1\frac{1}{2}$  Inch.

All Sets Furnished with No. 2 Electric Tap Wrench. Illustrated on Page 132.



- No. 20. Stock 40 inches long. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ , 1, 1 $\frac{1}{2}$  inches, \$35.00
- No. 25. Stock 52 inches long. Cutting  $\frac{1}{8}$ , 1, 1 $\frac{1}{2}$ , 1 $\frac{3}{4}$ , 1 $\frac{1}{2}$  inches, 45.00
- No. 30. Stock 52 inches long. Cutting 1 $\frac{1}{8}$ , 1 $\frac{1}{4}$ , 1 $\frac{1}{2}$  inches. 37.50
- No. 40. Stock 23 inches long for first seven sizes, 40-Inch Stock for the larger sizes. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , 1, 1 $\frac{1}{2}$ , 1 $\frac{3}{4}$  inches, 40.00
- No. 50. Stock 28 inches long for first nine sizes, 52-Inch Stock for the larger sizes. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , 1, 1 $\frac{1}{2}$ , 1 $\frac{3}{4}$ , 1 $\frac{1}{2}$  inches, 00.00
- Will send above sets  $\frac{1}{2}$  oversize, V thread unless otherwise ordered.

ALL OUR PLATES WARRANTED.



- Assortment No. 201, with adjustable tap wrench, Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ , \$15.50
- Assortment No. 205, with adjustable tap wrench, Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ , 1, 1 $\frac{1}{2}$ , 1 $\frac{3}{4}$ , 22.00
- Assortment No. 206, with adjustable tap wrench, Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ , 1, 31.25
- Assortment No. 207, with adjustable tap wrench, Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ , 1, 36.00
- Assortment No. 208, with adjustable tap wrench. Has two stocks, one 18 inches long, the other 23 inches long. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , 1, 24.00
- Assortment No. 209, with adjustable tap wrench. Has two stocks, one 18 inches long, the other 29 inches long. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , 1, 38.00
- Assortment No. 250, with adjustable tap wrench up to 1 inch. Cutting  $\frac{1}{8}$ ,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ , 1, 1 $\frac{1}{2}$ , 1 $\frac{3}{4}$ , 84.00
- Unless otherwise ordered, V form of thread *exact* sizes, will be sent U.S.S. or Whitworth form of thread furnished at same price, if desired, also rough iron sizes, when ordered.

ALL OUR PLATES WARRANTED.

## THE CHAMPION

## "EASY" SCREW PLATE WITH TAP WRENCH.

NOTICE.—Every Set Supplied with Our Patent Adjustable Electric Tap Wrench.  
All Our Taps are Machine-Relieved.



## PRICES AND DIMENSIONS.

No. 1a, Plate Complete in Box. Length of stock, 18 inches.	\$9.75
Cutting $\frac{1}{10}$ , $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ .	
No. 2a, Plate Complete in Box. Length of stock, 23 inches.	11.10
Cutting $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ , $\frac{5}{8}$ .	
No. 3a, Plate Complete in Box. Length of stock, 26 inches.	12.50
Cutting $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ .	
No. 4a, Plate Complete in Box. Length of stock, 26 inches.	14.40
Cutting $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , $\frac{1}{1}$ , $\frac{1 1}{8}$ .	
No. 5a, Plate Complete in Box. Length of stock, 23 inches.	13.00
Cutting $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , $\frac{1}{1}$ , $\frac{1 1}{8}$ , $\frac{1 1}{4}$ , $\frac{1 1}{2}$ .	
No. 5 1/2a, Plate Complete in Box. Length of stock, 23 inches.	15.75
Cutting $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ , $\frac{1}{1}$ , $\frac{1 1}{8}$ , $\frac{1 1}{4}$ , $\frac{1 1}{2}$ , $\frac{3}{4}$ .	
No. 6a, Plate Complete in Box. Length of stock, 26 inches.	18.50
Cutting $\frac{3}{4}$ , $\frac{7}{8}$ , $\frac{1}{1}$ , $\frac{1 1}{8}$ , $\frac{1 1}{4}$ , $\frac{1 1}{2}$ , $\frac{3}{4}$ , $\frac{1 3}{4}$ .	
No. 7a, Plate Complete in Box. Length of stock 26 inches.	21.15
Cutting $\frac{7}{8}$ , $\frac{1}{1}$ , $\frac{1 1}{8}$ , $\frac{1 1}{4}$ , $\frac{1 1}{2}$ , $\frac{3}{4}$ , $\frac{1 3}{4}$ , $\frac{1 7}{8}$ .	
No. 8a, Plate Complete in Box. Has two stocks, 18 inches long for first four sizes, 26 inches for the larger sizes. Cutting $\frac{1}{10}$ , $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ .	15.20
No. 9a, Plate Complete in Box. Has stocks same as No. 8a. Cutting $\frac{1}{8}$ , $\frac{3}{16}$ , $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ , $\frac{5}{8}$ .	22.30
No. 9 1/2a, Plate Complete in Box. Has stocks same as No. 8. Cutting $\frac{1}{4}$ , $\frac{5}{16}$ , $\frac{3}{8}$ , $\frac{7}{16}$ , $\frac{1}{2}$ , $\frac{5}{8}$ , $\frac{3}{4}$ , $\frac{7}{8}$ .	24.80

Unless otherwise ordered, we will send all Screw Plates, 3/4 oversize V thread. Can supply Screw Plates with extra stock, 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 3, 3 1/4, 3 1/2, 4, 4 1/4, 4 1/2, 5, 5 1/4, 5 1/2, 6, 6 1/4, 6 1/2, 7, 7 1/4, 7 1/2, 8, 8 1/4, 8 1/2, 9, 9 1/4, 9 1/2, 10, 10 1/4, 10 1/2, 11, 11 1/4, 11 1/2, 12, 12 1/4, 12 1/2, 13, 13 1/4, 13 1/2, 14, 14 1/4, 14 1/2, 15, 15 1/4, 15 1/2, 16, 16 1/4, 16 1/2, 17, 17 1/4, 17 1/2, 18, 18 1/4, 18 1/2, 19, 19 1/4, 19 1/2, 20, 20 1/4, 20 1/2, 21, 21 1/4, 21 1/2, 22, 22 1/4, 22 1/2, 23, 23 1/4, 23 1/2, 24, 24 1/4, 24 1/2, 25, 25 1/4, 25 1/2, 26, 26 1/4, 26 1/2, 27, 27 1/4, 27 1/2, 28, 28 1/4, 28 1/2, 29, 29 1/4, 29 1/2, 30, 30 1/4, 30 1/2, 31, 31 1/4, 31 1/2, 32, 32 1/4, 32 1/2, 33, 33 1/4, 33 1/2, 34, 34 1/4, 34 1/2, 35, 35 1/4, 35 1/2, 36, 36 1/4, 36 1/2, 37, 37 1/4, 37 1/2, 38, 38 1/4, 38 1/2, 39, 39 1/4, 39 1/2, 40, 40 1/4, 40 1/2, 41, 41 1/4, 41 1/2, 42, 42 1/4, 42 1/2, 43, 43 1/4, 43 1/2, 44, 44 1/4, 44 1/2, 45, 45 1/4, 45 1/2, 46, 46 1/4, 46 1/2, 47, 47 1/4, 47 1/2, 48, 48 1/4, 48 1/2, 49, 49 1/4, 49 1/2, 50, 50 1/4, 50 1/2, 51, 51 1/4, 51 1/2, 52, 52 1/4, 52 1/2, 53, 53 1/4, 53 1/2, 54, 54 1/4, 54 1/2, 55, 55 1/4, 55 1/2, 56, 56 1/4, 56 1/2, 57, 57 1/4, 57 1/2, 58, 58 1/4, 58 1/2, 59, 59 1/4, 59 1/2, 60, 60 1/4, 60 1/2, 61, 61 1/4, 61 1/2, 62, 62 1/4, 62 1/2, 63, 63 1/4, 63 1/2, 64, 64 1/4, 64 1/2, 65, 65 1/4, 65 1/2, 66, 66 1/4, 66 1/2, 67, 67 1/4, 67 1/2, 68, 68 1/4, 68 1/2, 69, 69 1/4, 69 1/2, 70, 70 1/4, 70 1/2, 71, 71 1/4, 71 1/2, 72, 72 1/4, 72 1/2, 73, 73 1/4, 73 1/2, 74, 74 1/4, 74 1/2, 75, 75 1/4, 75 1/2, 76, 76 1/4, 76 1/2, 77, 77 1/4, 77 1/2, 78, 78 1/4, 78 1/2, 79, 79 1/4, 79 1/2, 80, 80 1/4, 80 1/2, 81, 81 1/4, 81 1/2, 82, 82 1/4, 82 1/2, 83, 83 1/4, 83 1/2, 84, 84 1/4, 84 1/2, 85, 85 1/4, 85 1/2, 86, 86 1/4, 86 1/2, 87, 87 1/4, 87 1/2, 88, 88 1/4, 88 1/2, 89, 89 1/4, 89 1/2, 90, 90 1/4, 90 1/2, 91, 91 1/4, 91 1/2, 92, 92 1/4, 92 1/2, 93, 93 1/4, 93 1/2, 94, 94 1/4, 94 1/2, 95, 95 1/4, 95 1/2, 96, 96 1/4, 96 1/2, 97, 97 1/4, 97 1/2, 98, 98 1/4, 98 1/2, 99, 99 1/4, 99 1/2, 100, 100 1/4, 100 1/2, 101, 101 1/4, 101 1/2, 102, 102 1/4, 102 1/2, 103, 103 1/4, 103 1/2, 104, 104 1/4, 104 1/2, 105, 105 1/4, 105 1/2, 106, 106 1/4, 106 1/2, 107, 107 1/4, 107 1/2, 108, 108 1/4, 108 1/2, 109, 109 1/4, 109 1/2, 110, 110 1/4, 110 1/2, 111, 111 1/4, 111 1/2, 112, 112 1/4, 112 1/2, 113, 113 1/4, 113 1/2, 114, 114 1/4, 114 1/2, 115, 115 1/4, 115 1/2, 116, 116 1/4, 116 1/2, 117, 117 1/4, 117 1/2, 118, 118 1/4, 118 1/2, 119, 119 1/4, 119 1/2, 120, 120 1/4, 120 1/2, 121, 121 1/4, 121 1/2, 122, 122 1/4, 122 1/2, 123, 123 1/4, 123 1/2, 124, 124 1/4, 124 1/2, 125, 125 1/4, 125 1/2, 126, 126 1/4, 126 1/2, 127, 127 1/4, 127 1/2, 128, 128 1/4, 128 1/2, 129, 129 1/4, 129 1/2, 130, 130 1/4, 130 1/2, 131, 131 1/4, 131 1/2, 132, 132 1/4, 132 1/2, 133, 133 1/4, 133 1/2, 134, 134 1/4, 134 1/2, 135, 135 1/4, 135 1/2, 136, 136 1/4, 136 1/2, 137, 137 1/4, 137 1/2, 138, 138 1/4, 138 1/2, 139, 139 1/4, 139 1/2, 140, 140 1/4, 140 1/2, 141, 141 1/4, 141 1/2, 142, 142 1/4, 142 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**NOTICE.—Every Set Supplied with Our Patent Adjustable Electric Tap Wrench.**



**ELECTRIC FULL-MOUNTED SCREW PLATES:**



The Full-Mounted Electric Stock and Die is constructed precisely in adjustment of dies like illustration and explanation on page 120 of this catalogue, which fully explains the entire mechanism of the Electric Patent Adjustable Dies. The only difference being in the Full-Mounted, in which every die is supplied with a stock complete in itself, thus being able to use different dies at the same time from the same set. The Full-Mounted Electric finishes the work at one cut. For cutting up close to the shoulder, use face side of die downwards.

### Special Notice to Mechanics.

We wish to call special attention to the general construction of the Electric Full-Mounted Screw Pulley. Our object is to show that each and every stock is supplied with hollow steel handles, making them light and strong, and precisely in principle like all first-class one-stock sets. The finish all through being the finest that can possibly be turned out, and therefore is placed on the market warranted strictly high grade in every particular and without an equal.

- |           |                        |   |                     |         |
|-----------|------------------------|---|---------------------|---------|
| No. 101.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | \$12.00 |
| No. 102.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 15.50   |
| No. 103.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 17.00   |
| No. 104.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 19.50   |
| No. 105.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 18.00   |
| No. 105½. | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 20.50   |
| No. 106.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 24.00   |
| No. 107.  | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 29.50   |
| No. 107½. | Plate Complete in Box. | Wrench. Cutting $\frac{1}{20}$ , $\frac{1}{16}$ , $\frac{1}{8}$ , $\frac{1}{4}$ , $\frac{1}{2}$ . | With adjustable Tap | 32.00   |

P. 8.  $\bar{a}^{14}$  Die, Stock Guide and Tap furnished with any of the above sets. \$2.10. For Full-Mounted Stocks, Dies, and Guides, see page 133.

ALL OUR PLATES WARRANTED.

# Armstrong Patent Tool Holders

ESPECIALLY ADAPTED FOR THE ECONOMICAL USE OF SELF-HARDENING STEEL.

## ARMSTRONG BORING TOOL

Patented March 12th, 1895.



Showing tool cutting a thread.

This tool is made entirely of steel, the wearing parts are hardened and it is finished in a first-class manner. The bar can be extended from its holder to any desired length to suit depth of hole. The cutters can be ground for V, or square thread, double end, round nose, or any desired shape. They can easily be made by simply grinding end of piece of self-hardening steel to the proper shape on a dry emery wheel, then nick all around on corner of stone and break off with sharp blow of hammer.



The above cut shows Double-Ended Cutter roughing out cored hole and also Angle Cutter Boring and Facing End.



We guarantee this tool to be as stiff and to take as heavy a cut as any forged tool of same size, and as it will take the place of about one dozen forged tools the great economy effected by its use can readily be seen.



Each set is put up in a substantial box and consists of holder and bar with straight and 45 degree end caps, two cutters, (ground for boring), wrench and a piece of Self-Hardening Steel for extra cutters.

No.	SIZE SHANK.	DIAM. BAR.	SIZE CUTTER.	NET WEIGHT.	PRICE COMPLT.	EXT. CUTTERS. Gr'd for Boring
8	$\frac{3}{8}$ x $\frac{1}{2}$ in.	$\frac{3}{8}$ inch	$\frac{3}{8}$ in. sq.	2 lb. 0 oz.	\$ 3.00	\$ .12 each
9	$\frac{1}{2}$ x 1 "	$\frac{1}{2}$ "	$\frac{1}{2}$ " "	4 " 0 "	3.60	.15 "
10	$\frac{5}{8}$ x $\frac{1}{2}$ "	$\frac{5}{8}$ "	$\frac{5}{8}$ " "	7 " 5 "	4.75	.20 "
11	$\frac{3}{4}$ x $\frac{1}{2}$ "	1 " "	1 " "	12 " 5 "	6.75	.30 "
12	$\frac{7}{8}$ x $\frac{1}{2}$ "	1 $\frac{1}{8}$ "	1 $\frac{1}{8}$ " "	17 " 12 "	10.00	.40 "

## ARMSTRONG BORING TOOL

ADAPTED TO USE IN LARGE LATHES WITH CLAMP TOOL REST.



Each set is put up in a substantial box and consists of shank and bar with straight and 45 degree end caps, two cutters, ground to shape, wrench and a piece of Self-Hardening Steel for extra cutters.

No.	SIZE SHANK.	DIAM. BAR.	L'GTH BAR.	SIZE CUTTER.	NET WGT.	PRICE COMP.	EXT. CUTTERS. Gr'd for Boring
15	1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ in.	1 $\frac{1}{2}$ in.	18 in.	1 $\frac{1}{2}$ inch.	17 lbs.	\$ 8.75	\$0.40 each.
16	1 $\frac{3}{4}$ x 2 $\frac{1}{2}$ "	1 $\frac{1}{4}$ "	21 "	1 $\frac{1}{2}$ "	25 "	10.50	.50 "
17	2 $\frac{1}{2}$ x 2 $\frac{1}{2}$ "	1 $\frac{3}{4}$ "	24 "	1 $\frac{1}{2}$ "	38 "	13.75	.70 "

## ARMSTRONG DRILL AND REAMER HOLDER



THESE HOLDERS have been in use in many large machine shops for years and have been pronounced by all to be the most ingenious and practical method of utilizing twist drills and reamers as boring tools in lathe work. The sockets are Morse standard taper. Holding drills by means of lathe dogs or other temporary or makeshift methods usually results in broken drills and loss of time, and this our drill holders are especially designed to avoid. EACH TOOL IS PACKED IN A NEAT BOX.

Patented Feb. 16, 1895.

No.	HOLDS DRILLS.	LENGTH.	WEIGHT.	PRICE.
1	$\frac{1}{8}$ to $\frac{1}{4}$ in.	10 in.	1 lb. 12 oz.	\$0.90
2	$\frac{1}{4}$ to $\frac{3}{8}$ in.	12 "	2 lb. 9 oz.	1.20
3	$\frac{3}{8}$ to $\frac{1}{2}$ in.	14 "	4 lb. 8 oz.	1.60
4	$\frac{1}{2}$ to 2 in.	16 "	7 lb. 8 oz.	2.60
5	2 $\frac{1}{4}$ to 3 in.	20 "	14 lb 8 oz.	4.00

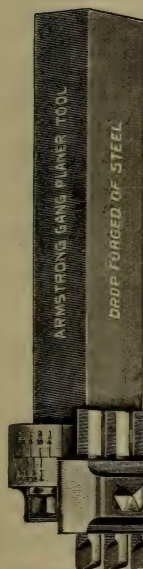
# Armstrong Patent Tool Holders

ESPECIALLY ADAPTED FOR THE ECONOMICAL USE OF SELF-HARDENING STEEL

## THE ARMSTRONG GANG PLANER TOOL.

(PATENT ALLOWED)

MADE IN THREE SIZES, ADJUSTABLE TO DIFFERENT FEEDS.



THE Armstrong Gang Planer Tool is especially adapted for surfacing large castings and on this class of work it will effect a saving of fifty to seventy-five per cent in the time required to do the same job with a single point tool. As shown in Fig. 1 the head of the tool is solidly secured to the shank, on which it swivels to a limited degree, by means of a deep and closely fitted tongue and socket and when set its position is fixed by means of two steel collar screws. The head is graduated thus enabling the tool to be quickly and accurately set to any desired feed. Both shank and head are drop forged of steel and all parts are hardened. The set screws are tool steel tempered on the point.

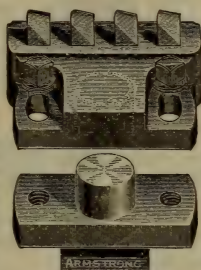


FIG. 1.



FIG. 2.

Fig. 2 shows a cut taken with the No. 61 Gang Planer Tool set to  $\frac{1}{4}$  inch feed, distributing the cut  $\frac{1}{8}$  inch on each cutter. Each chip being comparatively light a planer with this tool will carry with ease a feed and depth of cut much greater than would be possible when using an ordinary tool and there is moreover much less tendency to "break out" at the end of cut.

The cutters are made from stock sizes and shapes of self-hardening steel which are readily obtainable. In grinding cutters it is of course necessary to obtain uniformity of shape and clearance. To enable this to be done easily and accurately we furnish with each tool a gauge which will be found of great assistance in grinding cutters to proper shape to give best results. To line up cutters to uniform depth it is only necessary to let them rest on a flat surface while tightening set screws.

## PRICE LIST.

Each tool is packed in a neat box, and the following price includes one set of self-hardening steel cutters ground to shape, one gauge for grinding cutters and one wrench carefully fitted.

No.	SIZE SHANK	LENGTH OVER ALL	SIZE CUTTER	FEED ADJUSTMENT	WEIGHT	PRICE COMPLETE	EXTRA CUTTERS
61	$1\frac{1}{2} \times 1\frac{1}{2}$ in.	10 in.	$\frac{3}{4} \times \frac{1}{2}$ in.	0 to $\frac{1}{2}$ in.	10 lbs.	\$12.00	\$0.35
62	$1\frac{3}{4} \times 2\frac{1}{4}$ "	12 "	$\frac{1}{2} \times \frac{3}{4}$ "	0 to $\frac{3}{4}$ "	17 "	20.00	.60
63	$2 \times 2\frac{1}{2}$ "	14 "	$\frac{3}{4} \times \frac{1}{2}$ "	0 to $\frac{1}{2}$ "	31 "	35.00	.90

# Armstrong Patent Tool Holders

## ARMSTRONG THREADING TOOL

SIMPLICITY, STRENGTH AND PERMANENCE OF ADJUSTMENT ARE PROMINENT FEATURES OF THIS TOOL.



Patent applied for.

**Some good points  
of the  
Armstrong  
Threading Tool**

It will work close up to a shoulder.  
It has very few parts.  
Cutter is backed off and gives perfect clearance.  
Forging is entirely dispensed with.  
The use of this tool will effect a marked reduction in bills for tool steel and insures cutting threads of UNIFORM ANGLE.



### Price List.

Complete with drop forged wrench, and one single point cutter, Sharp V or U. S. Standard.

No.	SIZE.	NET WEIGHT.	PRICE.
50	$\frac{1}{2} \times \frac{1}{2} \times 5$ in	0 lb. 12 oz	\$2.25
51	$\frac{1}{2} \times 1 \times 6$ "	1 " 4 "	2.75
52	$\frac{1}{2} \times 1 \times 7$ "	2 " 0 "	3.50
53	$\frac{1}{2} \times 1 \times 8$ "	3 " 0 "	4.50

Tools equipped with single point Sharp V cutter will always be shipped unless otherwise specified.

### ARMSTRONG THREADING TOOLS

Equipped with one Single Point Whitworth Cutter

SIZE . . .	50	51	52	53
PRICE	\$2.50	\$3.10	\$4.00	\$5.00

### CUTTERS FURNISHED.

WE MAKE AND CARRY IN STOCK SINGLE POINT AND CHASING CUTTERS TO CUT THE PITCHES LISTED BENEATH, IN SHARP V, WHITWORTH AND UNITED STATES STANDARD THREADS.

#### Single Point Cutters.

SIZE TOOL.	PITCHES.
No. 50	6 to 20 threads per inch.
No. 51	5 to 20 " "
No. 52	4 to 20 " "
No. 53	3 to 20 " "

#### Chaser Cutters.

SIZE TOOL.	PITCHES.
No. 50	14, 16, 18, 20, 24
No. 51	12, 18, 14, 16, 18, 20, 24
No. 52	8, 10, 11, 12, 18, 14, 16, 18, 20
No. 53	8, 10, 11, 12, 18, 14, 16, 18, 20

### PRICE LIST OF CUTTERS.

#### Single Point Cutters.

SIZE	50	51	52	53
Sharp V.	\$0.45	\$0.55	\$0.70	\$0.90
U. S. Stan'd	0.50	0.60	0.75	0.95
Whitworth	0.75	0.90	1.15	1.40

#### Chaser Cutters.

SIZE . . .	50	51	52	53
Sharp V.	\$0.90	\$1.05	\$1.20	\$1.30
U. S. Stan'd	0.90	1.05	1.20	1.30
Whitworth	1.25	1.40	1.65	1.80

NOTE—In ordering tools or cutters to cut Whitworth or U. S. Standard Threads be careful to specify pitch.

### ARMSTRONG SELF-HARDENING STEEL

Sold in 3-ft. bars only

EVERY BAR IS CAREFULLY TESTED AND CARRIES ARMSTRONG BROS. TOOL CO.'S LABEL AND GUARANTEED

#### PRICE LIST

STEEL OF SIZE AND SHAPE SUITABLE FOR USE IN ARMSTRONG TOOL HOLDERS.

Length.	Size.	Price.	Size.	Price.
3 ft.	$\frac{3}{8}$ in. sq	\$0.50	$\frac{1}{2} \times \frac{1}{2}$ in.	\$0.85
3 "	$\frac{1}{2}$ " " "	0.60	$\frac{1}{2} \times \frac{1}{2}$ "	1.60
3 "	$\frac{3}{4}$ " " "	0.85	$\frac{1}{2} \times \frac{1}{2}$ "	2.10
3 "	$\frac{1}{2}$ " " "	1.20	$\frac{1}{2} \times \frac{1}{2}$ "	3.00
3 "	$\frac{3}{4}$ " " "	1.65	$\frac{1}{2} \times \frac{1}{2}$ "	4.20
3 "	$\frac{1}{2}$ " " "	2.10	$\frac{1}{2} \times \frac{1}{2}$ "	5.75
3 "	$\frac{3}{4}$ " " "	3.00		
3 "	$\frac{1}{2}$ " " "	4.50		

#### Price List—Bevel Rolled Steel.

FOR USE IN ARMSTRONG CUTTING-OFF TOOLS.

NOTE—This steel is rolled to approximate width to fit ARMSTRONG CUTTING-OFF TOOLS but requires grinding on edges to bring to exact size.

Size of Steel	Fits Tools.	Length.	Price.
$\frac{1}{2} \times \frac{1}{2}$ in.	No. 20 & 30	8 ft.	\$0.75
$\frac{1}{2} \times \frac{1}{2}$ "	" 21 " 31	" "	1.00
$\frac{1}{2} \times \frac{1}{2}$ "	" 22 " 32	" "	1.25
$\frac{1}{2} \times \frac{1}{2}$ "	" 23 " 33	" "	1.60
$\frac{1}{2} \times \frac{1}{2}$ "	" 24 " 34	" "	2.00
$\frac{1}{2} \times \frac{1}{2}$ "	" 25 " 35	" "	2.75
$\frac{1}{2} \times \frac{1}{2}$ "	" 26 " 36	" "	3.10



## Armstrong Patent Tool Holders

ESPECIALLY ADAPTED FOR THE ECONOMICAL USE OF SELF-HARDENING STEEL.

### ARMSTRONG CUTTING-OFF TOOLS

Patented November 14th, 1899.

**N**o other form of lathe tool is the proportion of cost of maintenance to effective work performed so great as in a Cutting-Off Tool. Therefore in no other form is the tool holder principle so effective or economical.

The Armstrong Cutting-Off Tool has already to a large extent displaced the solid forged tool and other crude and ill-designed tools heretofore on the market.

The Armstrong Cutting-Off Tools will cut off and keep right on cutting off.

They stand the racket of constant work and this is one of the chief points of difference between the genuine Armstrong Tool Holders and imitations of them.

The Holder and Bolts are made of steel and hardened. The Blades are made of special grade self-hardening steel, rolled beveled on both sides, giving the proper clearance to insure a clean cutting tool and requiring grinding on the cutting end only.

#### ARMSTRONG STRAIGHT SHANK



#### CUTTING-OFF TOOL.

Each tool is packed in a neat, substantial box and the following price includes one self-hardening steel blade and a drop forged wrench carefully fitted.

No.	SIZE HOLDER.	SIZE BLADE.	NET WEIGHT.	PRICE COMPLETE.	EXTRA BLADES.
20	$\frac{1}{2}$ x 1 x 5 in.	$\frac{3}{8}$ x $\frac{1}{2}$ x 5 $\frac{1}{2}$ in	0 lb. 12 oz.	\$1.65	\$0.25 each.
21	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 6 "	$\frac{1}{2}$ x $\frac{1}{2}$ x 6 $\frac{1}{2}$ "	1 " 5 "	1.80	.35 "
22	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 7 "	$\frac{1}{2}$ x $\frac{1}{2}$ x 7 $\frac{1}{2}$ "	2 " 2 "	2.80	.45 "
23	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 8 "	$\frac{1}{2}$ x 1 x 8 $\frac{1}{2}$ "	3 " 4 "	3.00	.60 "
24	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 9 "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 9 $\frac{1}{2}$ "	4 " 8 "	3.80	.75 "
25	1 x 1 $\frac{1}{2}$ x 10 "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 10 $\frac{1}{2}$ "	6 " 8 "	4.75	.95 "
26	1 $\frac{1}{2}$ x 2 x 11 "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 11 $\frac{1}{2}$ "	8 " 5 "	6.50	1.25 "

For some kinds of work a cutting-off tool made "off-set" so that the blade is held at an angle to the shank, is more convenient to use than the regular straight shank tool. To meet the demand for a tool of this character we present the Armstrong Off-set Cutting-Off Tool. It will be found to possess all the merits of the straight shank tool and is equally as rigid. The blades are interchangeable with the straight shank tool of corresponding size.

#### ARMSTRONG OFF-SET



#### CUTTING-OFF TOOL.

Each tool is packed in a neat, substantial box, and the following price includes one self-hardening steel blade and a drop forged wrench carefully fitted.

No.	SIZE SHANK.	SIZE BLADE.	NET WEIGHT.	PRICE COMPLETE.	EXTRA BLADES.
30	$\frac{1}{2}$ x 1 in.	$\frac{3}{8}$ x $\frac{1}{2}$ x 5 $\frac{1}{2}$ in.	1 lb. 0 oz.	\$1.65	\$0.25 each.
31	$\frac{1}{2}$ x 1 $\frac{1}{2}$ "	$\frac{1}{2}$ x $\frac{1}{2}$ x 6 $\frac{1}{2}$ "	1 " 11 "	1.80	.35 "
32	$\frac{1}{2}$ x 1 $\frac{1}{2}$ "	$\frac{1}{2}$ x $\frac{1}{2}$ x 7 $\frac{1}{2}$ "	2 " 9 "	2.80	.45 "
33	$\frac{1}{2}$ x 1 $\frac{1}{2}$ "	$\frac{1}{2}$ x 1 x 8 $\frac{1}{2}$ "	3 " 14 "	3.00	.60 "
34	$\frac{1}{2}$ x 1 $\frac{1}{2}$ "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 9 $\frac{1}{2}$ "	5 " 5 "	3.80	.75 "
35	1 x 1 $\frac{1}{2}$ "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 10 $\frac{1}{2}$ "	7 " 12 "	4.75	.95 "
36	1 $\frac{1}{2}$ x 2 "	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 11 $\frac{1}{2}$ "	9 " 11 "	6.50	1.25 "

## Armstrong Patent Tool Holders

ESPECIALLY ADAPTED FOR THE ECONOMICAL USE OF SELF-HARDENING STEEL.

### ARMSTRONG SPECIAL PLANER TOOL.

PATENT APPLIED FOR.



Fig. 1.

A Tool Holder for general work on planers and shapers.

This tool is pronounced by all who have seen or used it to be a money-saver.

It is a decided and practical extension of the Armstrong idea.

The shank is drop forged of steel and is case hardened.

The cutters are of self-hardening steel rectangular in shape and of stock sizes.

By means of grooved seats into which they are placed the cutters may be quickly adjusted to any desirable angle, and at the same time so locked into position as to render slipping impossible.

The Armstrong Planer Tool can be used either right or left hand (see Fig. 1) and when desirable or necessary, as for instance, when cutting a keyway, it may, by simply reversing the cutter and turning the tool around, be transformed into the equivalent of a "goose-neck" tool. (see Fig. 2.)

One of these tools equipped with an assortment of properly ground cutters will effectively equal a complete set of solid forged planer tools.

Each tool is packed in a neat substantial box, and the following price includes two self-hardening steel cutters ground to shape and a drop forged wrench carefully fitted.

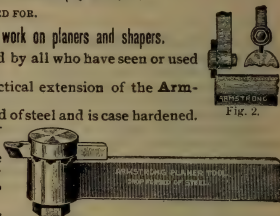


Fig. 2.

No.	SIZE SHANK.	LENGTH.	SIZE CUTTER.	NET WEIGHT.	PRICE COMPLETE.	EXTRA CUTTERS.
40	$\frac{1}{2}$ x 1 inch	7 inch	$\frac{1}{2}$ x $\frac{3}{8}$ inch	2 lb 0 oz.	\$ 2.75	\$ .20 ea.
41	$\frac{3}{4}$ x $1\frac{1}{2}$ "	10 "	$\frac{3}{4}$ x $\frac{1}{2}$ "	4 " 11 "	4.50	.40 "
410	$\frac{3}{4}$ x $1\frac{1}{2}$ "	10 "	$\frac{3}{4}$ x $\frac{1}{2}$ "	4 " 6 "	4.50	.40 "
42	$1\frac{1}{2}$ x $1\frac{1}{2}$ "	13 "	$\frac{3}{4}$ x $\frac{1}{2}$ "	10 " 9 "	7.00	.70 "
43	$1\frac{1}{2}$ x $1\frac{1}{2}$ "	16 "	$\frac{3}{4}$ x $\frac{1}{2}$ "	18 " 13 "	11.00	1.00 "
44	$1\frac{1}{2}$ x 2 "	20 "	$\frac{3}{4}$ x 1 "	32 " 8 "	16.00	2.00 "

### ARMSTRONG TOOL HOLDER SETS.

#### The Armstrong Tool Holder Set No. AO.



#### The Armstrong Combination Set No. 80.



**THIS SET** is especially adapted for use by Electricians, Model Makers, Bicycle Makers and Amateur Machinists. It consists of one No. 0 Tool Holder, one drop forged wrench and nine ground and finished cutters made of Armstrong special self-hardening steel, assorted points. Put up in polished hardwood case. Weight complete 1 lb. 2 oz. Price, \$3 00

**THIS SET** comprises a complete equipment for turning, planing and boring; it consists of one No. 8 boring tool with wrench and six cutters; one No. 0 lathe and shaper tool holder with six assorted cutters and wrench and one piece of Armstrong special self-hardening steel 9 in. long. Put up in polished hardwood case. Weight complete 3 lbs 9 oz. Price, \$7.00

# Armstrong Patent Tool Holders

ESPECIALLY ADAPTED FOR THE ECONOMICAL USE OF SELF-HARDENING STEEL.

These Tool Holders are rapidly displacing the old fashioned forged tools and are now used in most progressive machine shops.

THE saving effected by these tool holders in time, money, labor and annoyance can hardly be over-estimated. They obviate all danger of steel being burned or worked badly. They save the men from going to the tool dresser, machines standing idle, etc. etc. With them no stock of heavy steel need be carried, and many points of various shapes can be kept on hand, ready for instant use, which will take up but little room and enable the men to turn out more and better work.

## Their Points of Merit

Forging and tempering are entirely dispensed with and grinding is reduced to a minimum.

The points can be ground to any desired shape or clearance and can always be kept at the same height.

As there are no side projections they can be used close into a corner.

The rake of the cutter is such that it takes a clean curling chip from wrought iron or steel. No top grinding being necessary.

There is absolutely no slip to the cutter; it is supported directly under the strain of the cut, and will do as heavy work as any forged tool of same size.

One pound of tool steel used in these holders equals ten pounds in the ordinary tool.



Straight Tool, turning.  
Note perfect clearance.



Right Hand Off-set Tool,  
boring.

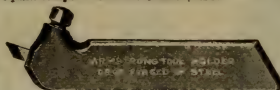


Right and Left Hand  
Off-set Tools, turning.



Straight Tool, planing.  
No side projections.

## ARMSTRONG STRAIGHT SHANK



## TOOL HOLDER

Each tool is packed in a neat substantial box and the following price includes three self-hardening steel cutters (ground to shape) and a drop forged wrench carefully fitted.

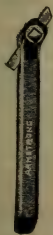
No.	SIZE HOLDER.	SIZE CUTTER.	NET WEIGHT.	PRICE COMPLETE.	EXTRA CUTTERS.
0	$\frac{3}{8}$ x $\frac{1}{2}$ x 5 in.	$\frac{3}{16}$ in. sq.	0 lb 8 oz.	\$ 1.65	\$0.12 each.
1	$\frac{1}{2}$ x 1 x 6 "	$\frac{1}{4}$ "	1 " 0 "	1.80	.15 "
2	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 7 "	$\frac{3}{16}$ "	1 " 12 "	2.30	.22 "
3	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 8 "	$\frac{1}{4}$ "	2 " 10 "	3.00	.30 "
4	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 9 "	$\frac{3}{16}$ "	3 " 12 "	3.80	.40 "
5	1 x 1 $\frac{1}{2}$ x 10 "	$\frac{1}{2}$ "	5 " 5 "	4.75	.50 "
6	1 $\frac{1}{2}$ x 2 x 12 "	$\frac{3}{8}$ "	9 " 6 "	7.00	.75 "
7	1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x 16 "	$\frac{1}{2}$ "	18 " 6 "	12.00	1.50 "

## ARMSTRONG OFF-SET TOOL HOLDER

Each tool is packed in a neat substantial box and the following price includes two self-hardening steel cutters (ground to shape) and a drop forged wrench carefully fitted.

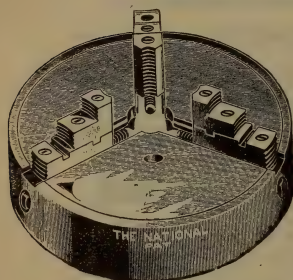
No. RIGHT OR LEFT.	SIZE HOLDER.	SIZE CUTTER.	NET WEIGHT.	PRICE COMPLETE.	EXTRA CUTTERS.
0	$\frac{3}{8}$ x $\frac{1}{2}$ x 6 in.	$\frac{3}{16}$ in. sq.	0 lb. 12 oz.	\$ 1.65	\$0.12 each.
1	$\frac{1}{2}$ x 1 x 8 "	$\frac{1}{4}$ "	1 " 6 "	1.80	.15 "
2	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 9 "	$\frac{3}{16}$ "	2 " 5 "	2.30	.22 "
3	$\frac{1}{2}$ x 1 $\frac{1}{2}$ x 10 "	$\frac{1}{4}$ "	3 " 6 "	3.00	.30 "
4	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 11 "	$\frac{3}{16}$ "	5 " 0 "	3.80	.40 "
5	1 x 1 $\frac{1}{2}$ x 12 $\frac{1}{2}$ "	$\frac{1}{2}$ "	6 " 14 "	4.75	.50 "
6	1 $\frac{1}{2}$ x 2 x 15 "	$\frac{3}{8}$ "	11 " 3 "	7.00	.75 "
7	1 $\frac{1}{2}$ x 2 $\frac{1}{2}$ x 20 "	$\frac{1}{2}$ "	22 " 8 "	12.00	1.50 "

Note—In ordering always specify whether Right or Left hand is wanted.



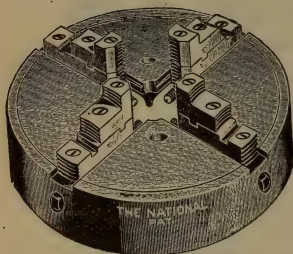
# THE NATIONAL IMPROVED COMBINATION AND UNIVERSAL CHUCK.

## COMBINATION.



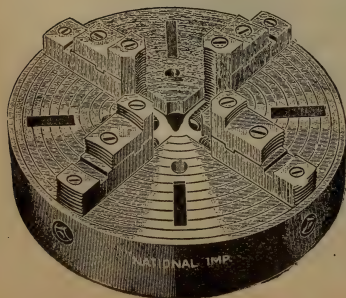
SIZE.	Price THREE JAW	Price FOUR JAW
4 inches	\$ 22.00	\$ 26.00
6 "	26.00	32.00
9 "	34.00	42.00
12 "	44.00	56.00
15 "	52.00	64.00
18 "	62.00	75.00
21 "	80.00	95.00
24 "	100.00	120.00
30 "	170.00	200.00
36 "	230.00	285.00
42 "	270.00	325.00

## UNIVERSAL.



SIZE.	Price THREE JAW	Price FOUR JAW
4 inches	\$ 22.00	\$ 26.00
6 "	26.00	32.00
9 "	34.00	42.00
12 "	44.00	56.00
15 "	52.00	64.00
18 "	62.00	75.00
21 "	80.00	95.00
24 "	100.00	120.00
30 "	170.00	200.00
36 "	230.00	285.00
42 "	270.00	325.00

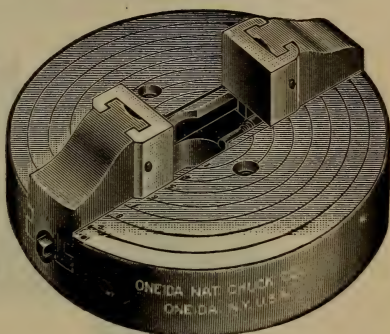
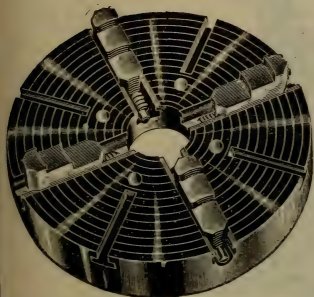
## NATIONAL IMPROVED INDEPENDENT. FOUR JAWS.



SIZE.	PRICE.
6 inches	\$ 18.00
9 "	23.00
12 "	30.00
15 "	35.00
18 "	44.00
21 "	55.00
24 "	65.00
26 "	80.00
30 "	120.00
36 "	190.00
42 "	280.00

Three Jaw Independent Chucks furnished  
if desired.



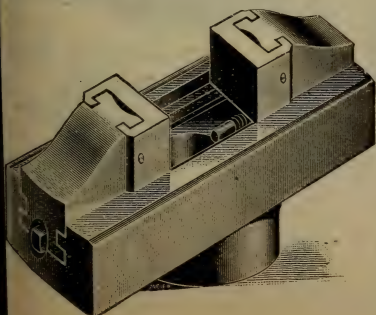
**ONEIDA NATIONAL INDEPENDENT.**

SIZE.	PRICE.	CENTER HOLE.	FACE PLATE.	APPROXIMATE WEIGHT.
4 inches	\$ 14.00	1 inch	$2\frac{3}{4}$ inch	5 lbs.
6 "	18.00	$1\frac{1}{2}$ "	$3\frac{1}{2}$ "	16 "
8 "	22.00	$1\frac{3}{4}$ "	$3\frac{1}{2}$ "	26 "
9 "	23.00	2 "	$5\frac{1}{2}$ "	31 "
10 "	26.00	$2\frac{1}{4}$ "	5 "	37 "
12 "	30.00	$2\frac{1}{2}$ "	$6\frac{1}{2}$ "	64 "
14 "	34.00	3 "	$7\frac{3}{8}$ "	80 "
16 "	38.00	$3\frac{1}{2}$ "	$7\frac{5}{8}$ "	120 "
18 "	44.00	$3\frac{3}{4}$ "	9 "	145 "
20 "	50.00	4 "	9 "	185 "
24 "	65.00	5 "	12 "	250 "
30 "	120.00	$5\frac{1}{2}$ "	15 "	448 "
36 "	200.00	$7\frac{1}{2}$ "	18 "	527 "

**Two Jaws.**

Price, Including One Set False Jaws.

SIZE.	PRICE.	FALSE JAWS.
4	\$18 00	\$1.75
7	20.00	2.00
9	27.00	3.00
12	34.00	3.50
14	40.00	4.00
17	48.00	4.50

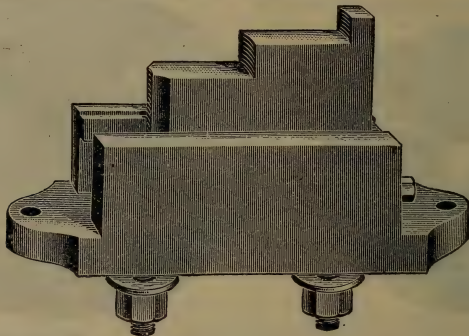
**BOX CHUCK.**

SIZE.	PRICE.
7 inches.	\$24 00
9 "	30.00
12 "	36.00
15 "	42.00

This style Chuck is recommended when an Independent Two-Jaw Chuck is desired. This Chuck is made very strong, with our Special False Jaw, which can be removed so as to hold round stock with permanent jaw, which are complete for use, without the False Jaw, for many classes of work.

## THE NATIONAL FACE PLATE JAWS.

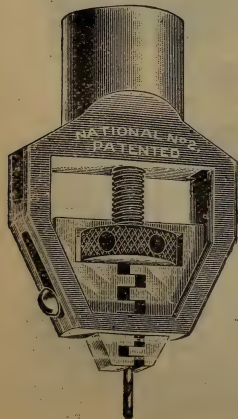
Made in two sizes. Special sizes made to order; also special jaws made when specified at a slight advance.



Style.	Size.	Length of Body.	Length Over All.	Extreme Height.	Weight Each.	Price Set of Three.	Price Set of Four.
A	8 in.	7 $\frac{1}{2}$ in.	11 $\frac{3}{8}$ in.	5 $\frac{1}{4}$ in.	21 lbs.	\$45.00	\$60.00
B	10 "	10 $\frac{1}{4}$ "	14 "	5 $\frac{3}{8}$ "	26 "	60.00	80.00

## NATIONAL DRILL CHUCK.

Has no Equal.



### NATIONAL DRILL CHUCKS, POLISHED.

No. 1—Holding Drill	0 to $\frac{1}{4}$ inch	\$ 6.00
No. 2—"	" 0 to $\frac{3}{8}$ "	7.00
No. 3—"	" 0 to $\frac{1}{2}$ "	8.00
No. 4—"	" 0 to $\frac{3}{4}$ "	9.00
No. 5—"	" 0 to 1 "	11.00
No. 6—"	" 0 to 1 $\frac{1}{2}$ "	13.00
No. 7—"	" 0 to 2 "	20.00

### NATIONAL DRILL CHUCKS, UNPOLISHED.

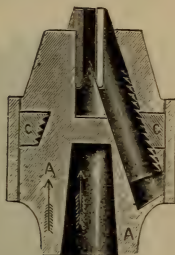
For heavy, rough work, or where polished tools are not desired. Quality being the same but less in price.

No. 8—Holding Drill	0 to $\frac{1}{4}$ inch	\$ 5.00
No. 9—"	" 0 to $\frac{3}{8}$ "	5.50
No. 10—"	" 0 to $\frac{1}{2}$ "	6.50
No. 11—"	" 0 to $\frac{3}{4}$ "	7.50
No. 12—"	" 0 to 1 "	10.00
No. 13—"	" 0 to 1 $\frac{1}{2}$ "	13.00
No. 14—"	" 0 to 2 "	18.00

6 and 13 fitted for face plate unless ordered for arbor.  
7 and 14 goes on with face plate only.

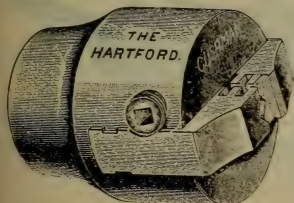
# DRILL CHUCKS.

## Union Czar Drill Chuck.



### Price List.

No.	Holds.	PRICE.
No. 1, . . . . .	0 to $\frac{3}{16}$	\$5.50
" 2, . . . . .	0 to $\frac{5}{16}$	5.50
" 3, . . . . .	0 to $\frac{1}{2}$	9.00

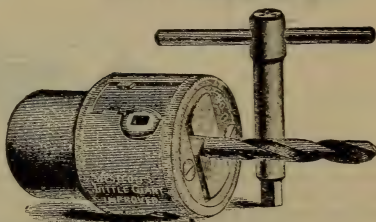


## The Hartford Drill Chuck.

### Price-List.

		Extra Jaws, per pair.	Extra Screws each.
No. 0	\$6.00	\$2.00	\$ .80
No. 1	7.00	2.25	1.00
No. 2	8.00	2.50	1.20
No. 3	10.00	4.00	2.00

## Westcott's Patent Little Giant Improved DRILL CHUCK.

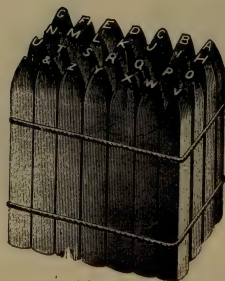


### Price List of Little Giant Improved. EXTRA STRONG SCREWS.

No.	Approx. Diam	Holding Drills.	Price.	Unfd Face Plates
00	1 7-16 inch.	0 to $\frac{1}{4}$ inch.	\$ 7.00	
0	$2\frac{1}{2}$ "	0 to $\frac{1}{2}$ "	8.00	
1	3 "	0 to $\frac{3}{4}$ "	9.00	
2	$3\frac{1}{2}$ "	0 to 1 "	10.00	
$2\frac{1}{2}$	4 "	0 to 1 in. ex. strong.	11.00	
3	6 "	0 to $1\frac{1}{2}$ inch.	18.00	\$o 75
4	$6\frac{1}{2}$ "	0 to 2 "	26.00	75

## STEEL STAMPS, LETTERS AND FIGURES

For Stamping Iron, Steel, Brass, Wood, Ivory, Mechanics' Tools  
and Patented Articles.



Letters.

Size Letters & Figures, inches	Price Stamps per letter	Price Figures per set of 9	Price Alpha- bets per set of 26
$\frac{1}{2}$	.35	\$2 50	\$ 7 50
$\frac{3}{8}$	.25	2 00	6 00
$\frac{1}{4}$	.20	1 50	4 50
$\frac{3}{16}$	.20	1 50	4 50
$\frac{1}{8}$	.20	1 50	4 50
$\frac{5}{16}$	.25	1 50	4 50
$\frac{3}{8}$	.25	2 00	6 00
$\frac{1}{2}$	.30	2 25	6 75
$\frac{5}{8}$	.40	3 00	9 00
$\frac{3}{4}$	.50	3 75	11 25
$\frac{7}{8}$	.60	4 50	13 50
$\frac{15}{16}$	.70	5 25	15 75
$\frac{1}{2}$	.80	6 00	18 00



Figures.

## REVOLUTION COUNTERS.



No. 1



No. 2

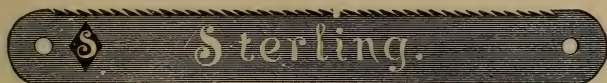


No. 2 Alarm.

These Counters can be used on any machine, where it is desirable to keep an automatic record of the work performed. A counter will soon pay for itself by preventing errors, and in the amount of time and labor it will save. Dials have large black figures that are easy to read at a distance, and by means of a key they can be instantly reset to zero or any number desired.

No. 1.	Counter, with 4 Dials, registering up to	10,000	Each, \$ 8 00
No. 2.	" " 5 " " "	100,000	" 10 00
No. 2.	" " 5 " " "	100,000 and with 4-inch gong to give alarm at each	" 15 00
	100		





## HACK SAW BLADES.

### PRICE LIST.

6-inch	1/2-inch wide	\$ .55	per dozen	\$ 6.60	per gross.
7 "	1/2 " "	.60	" "	7.20	" "
8 "	1/2 " "	.65	" "	7.80	" "
9 "	1/2 " "	.70	" "	8.40	" "
10 "	5/8 " "	.85	" "	10.20	" "
11 "	5/8 " "	.95	" "	11.40	" "
12 "	5/8 " "	1.05	" "	12.60	" "
14 "	5/8 " "	1.25	" "	15.00	" "
14 "	3/4 " "	1.50	" "	18.00	" "
17 "	3/4 " "	2.50	" "	30.00	" "

NOTE—Our 14 inch blades are  $13\frac{1}{2}$  inches from center of holes, and 17 inch Blades are  $16\frac{1}{2}$  inches from center of holes. All other sizes from center of holes.

Our standard goods, as listed above, have 15 teeth to the inch. We also make 8, 9, 10, 11 and 12-inch blades, 24 and 32 teeth per inch, at the same prices. Unless otherwise specified, 15-tooth blades are shipped in filling orders,

For tool and machinery steel,

Use 15-Point Saws.

For brass, aluminum and soft metals, also for coarse tubing,

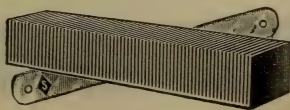
Use 24-Point Saws.

For tubing higher than 20 gauge.

Use 32-Point Saws.

Always use a NEW blade for cutting brass or tool steel.

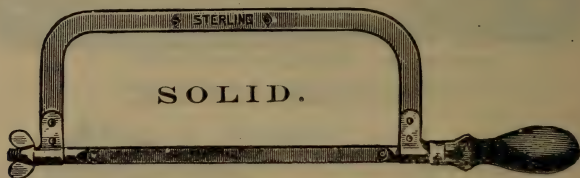
DISCOUNTS ON APPLICATION.



Fifty cuts were made in this inch square bar of Jessops' Unannealed Tool Steel, by one 12-inch STERLING " Hack Saw Blade, in a power machine.

The "STERLING" is the "Best Hack Saw in the World."

## "STERLING" HACK SAW FRAMES.

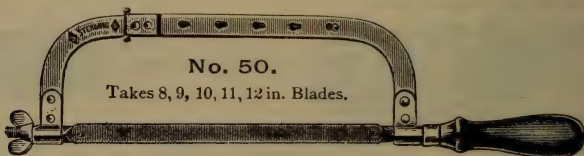


No. 20.	}	8 in.	9 in.	10 in.	12 in.	} Per dozen.
2½ in. deep		\$6.00	\$6.30	\$6.60	\$7.20	
						} Without Blade.

This is a strong, durable frame, polished ; blade will face in four directions.

No. 2.	}	8 in.	9 in.	10 in.	12 in.	} Per dozen.
3½ in. deep		\$8.40	\$8.70	\$9.00	\$9.60	
						} Without Blade.

This frame is 3½ in. deep, highly nickeled. Blade can be adjusted to four different angles. Black hardwood handle, strong, attractive and a good seller.



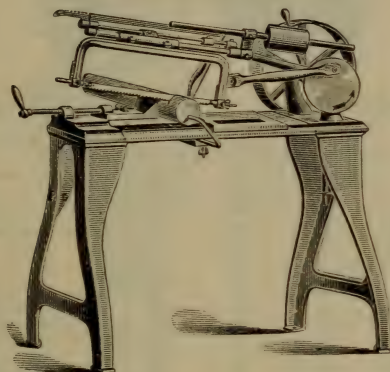
This frame is light, strong in center, can easily be adjusted for blades of any size. from 8 inch. to 12 inch. It is highly finished and very serviceable. Blade can be adjusted to four different angles. Price per dozen, \$12.00.



For workers of Iron, Steel and Metals, in the Mill Shop, or Works, where there's cutting to do the Hack Saw Blade is a constant necessity. Some are good, others poor, some better, only

ONE BEST—BY TEST—THE STERLING HACK SAW.

## STAR POWER HACK SAW.



Probably there is no more popular or satisfactory machine of any description made than the Star Power Saw, as per illustration above. It adapts itself to all kinds of work and cuts all shapes and sizes up to  $4\frac{1}{2}$  inches in diameter. It is self-feeding, requiring no attention while making a cut, and stops automatically when the work is completed. Blades used in the Star Power Saw get fair treatment and the saving made in them in this way will soon pay for a machine when there is much work to be done. It is arranged for blades either 10, 11 or 12 inches in length.

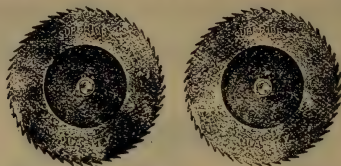
Six 12 inch blades are furnished with each Machine.

The Speed recommended is 45 strokes per minute.

Size of Pulley  $13\frac{1}{2} \times 2\frac{1}{2}$  inches Net weight 168 pounds.

PRICE EACH \$25.00.

## CIRCULAR AND BAND SAWS.



## PRICE OF CIRCULAR SAWS.

Diameter, inches.	Thick- ness, gauge.	Price, each.	Extra for each Additional Gauge. (Heavier.)	Price per Gauge for Beveling New Saws. (Grinding or beveling old saws extra.)
4	19	\$ 1 00	\$ .03	\$ 14
5	19	1 20	.04	16
6	18	1 40	.05	18
7	18	1 70	.06	20
8	18	2 00	.08	22
9	17	2 50	.10	25
10	16	3 00	.12	28
11	16	3 50	.14	30
12	15	3 75	.17	35
14	15	4 50	.21	40
16	14	5 50	.25	50
18	13	7 00	.30	60
20	13	8 50	.35	70
22	12	10 00	.45	80
24	11	12 00	.55	90
26	11	14 00	.65	1 05
28	10	16 00	.80	1 20
30	10	18 00	.90	1 30
32	10	20 00	1 00	1 40
34	9	22 50	1 20	1 55
36	9	25 50	1 40	1 70
38	9	30 00	1 75	1 85
40	9	35 00	2 00	2 00
42	8	42 00	2 50	2 20
44	8	50 00	3 00	2 40
46	8	60 00	3 50	2 60
48	8	70 00	4 00	2 80
50	7	80 00	4 50	3 00
52	7	90 00	5 00	3 25
54	7	100 00	6 00	3 50
56	7	115 00	7 00	3 75
58	7	130 00	8 00	4 05
60	6	145 00	9 00	4 35
62	6	160 00	10 00	4 65
64	6	180 00	12 00	5 00
66	6	200 00	15 00	5 35
68	5	225 00	18 00	5 75
70	5	255 00	21 00	6 15
72	5	290 00	24 00	6 55
74	5	330 00	27 00	7 00
76	5	375 00	30 00	7 50

No extra charge for saws one gauge thicker than list. Circular saws beveled one gauge without extra charge up to 41 inches; 41 inches and larger beveled two gauges without extra charge. Circular saws 48 inches and larger, if made thinner than 10 gauge, are not warranted. Add 10 per cent. to list for each gauge thinner than 10 gauge.

## BAND SAWS.

## PER RUNNING FOOT.

Giving the widths kept in stock at all times, from which orders can be filled promptly.

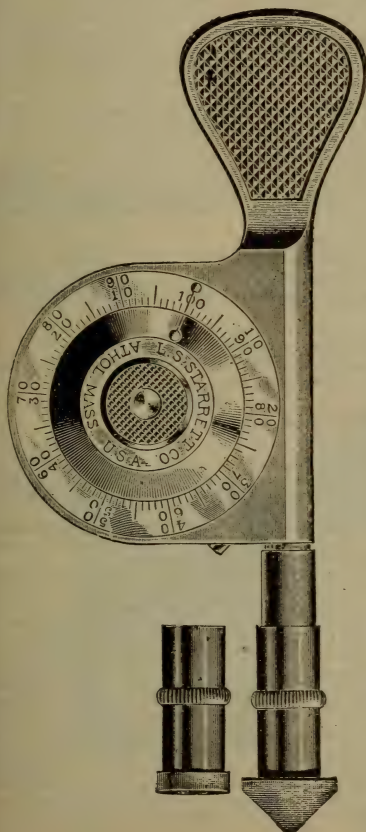
## NOT SET OR FILED.

1/2 usual gauge...	22	per foot,	\$ 15
1 1/8 "	22	"	15
1 1/4 "	21	"	15
1 3/4 "	21	"	17
2 "	21	"	17
2 1/2 "	21	"	19
3 "	21	"	21
3 1/2 "	20 to 21	"	22
4 "	20 to 21	"	24
4 1/2 "	20 to 21	"	25
5 "	19 to 20	"	27
5 1/2 "	19 to 20	"	30
6 "	19 to 20	"	37
6 1/2 "	17 to 19	"	65
7 "	17 to 19	"	85
7 1/2 "	17 to 19	"	1 05
8 "	17 to 19	"	1 25
8 1/2 "	16 to 19	"	1 45
9 "	16 to 19	"	1 65
9 1/2 "	16 to 19	"	1 85
10 "	16 to 19	"	2 05
10 1/2 "	15 to 19	"	2 25
11 "	15 to 19	"	2 65
11 1/2 "	14 to 17	"	3 05
12 "	14 to 17	"	3 45
12 1/2 "	14 to 17	"	3 85
13 "	14 to 17	"	4 35
13 1/2 "	14 to 17	"	5 00
14 "	12 to 14	"	6 00
14 1/2 "	12 to 14	"	7 00

Band Saws, when ordered brazed, filed or set, will be charged extra for brazing, filing or setting. All Saws guaranteed to be made from the best of material, and fully warranted when properly used.



## SPEED INDICATORS.



The ordinary speed indicator is extremely unsatisfactory, as it is cheaply constructed, is inaccurate and easily worn out.

The indicator here shown is a first-class tool in every respect.

It can be run at the highest speed without heating; the end of the spindle being provided with a special frictionless bearing.

The dial can be set to the zero mark without turning the spindle, and the dial provides for reading the revolutions of the shaft turning in either direction.

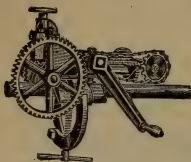
In addition to the ordinary steel point, two rubber tips are supplied. The cone-shaped tip instantly starts when pressed against the end of a shaft that has been centered, and the flat-faced tip is used for shafts which have not been centered.

Price each, net...\$1.00.

If leatherette case for indicator is desired, it will be supplied for 50 cents extra.

## PORTABLE KEY-SEATING MACHINES

n all sizes, to be operated either by hand, electric motor, flexible shaft or pulley.



WITH these machines it is not necessary to remove shafting from their hangers or boxes to cut a key-seat and in this way a pulley or coupling can be applied very quickly, they are all provided with either automatic or hand feed while cutting, and have an indicator to show the depth cut in the shaft. The machines will mill 4 inches and 6 inches respectively, before it is necessary to move the base forward on the shaft. An operator can easily cut a key-seat 12 inches long by  $\frac{5}{8}$  wide, 5-16 inch deep in one hour, and other sizes in proportion.

**No. 1 machine** will mill key-seats in any size shafting from  $\frac{3}{8}$  to  $4\frac{3}{4}$  inches in diameter the following widths,  $\frac{1}{4}$  inch (by sixteenths) to and including  $1\frac{1}{8}$  inches.

**Price** Complete with full set cutters, boxed, **\$40.00 Net.**  
Weight, net, 45 lbs.; boxed, 70 lbs.; measurements, 12 in. x 12 in. x 22 in.

**No. 1½ machine**, while it is designed especially for cutting key-seats in loom and other machine shafts, where the shafting extends 3 or more inches through bearings, it will do all that the No. 1 machine will, besides it will cut key-way to within 1 inch of the face of box.

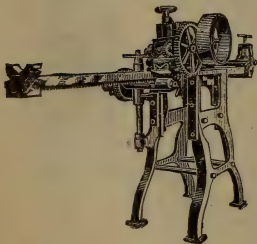
**Price** Complete, with full set cutters, boxed, **\$50.00 Net.**  
Weight, net, 65 lbs.; boxed, 90 lbs.; measurements, 12 in. x 12 in. x 22 in.

**No. 2 machine** will mill key-seats in any size shafting from 2 inches to 8 inches in diameter the following widths, from  $\frac{1}{4}$  inch (by sixteenths) to  $1\frac{1}{8}$  inches and  $1\frac{1}{2}$  inches (by eighths) to 2 inches.

**Price** Complete, with full set cutters, boxed, **\$60.00 Net.**  
Weight, net, 86 lbs.; boxed, 113 lbs.; measurements, 12 in. x 13 in. x 24 in.

By adding \$5.00 to the price of these machines, will furnish a pulley attachment, whereby they can be driven by belt power as well as by hand.

## COMBINATION MACHINE.



THIS ILLUSTRATION shows a combination of two very valuable labor saving machines, a PORTABLE KEY-SEATER in combination with a CONTINUOUS KEY-WAY or SPLINE CUTTER.

The advantages of this machine will be apparent to engineers, machine tool builders, millwrights, manufacturers and all others using shafting.

As a CONTINUOUS KEY-WAY or SPLINE-CUTTER it will mill accurately and in perfect alignment, any size key-way or spline, from  $\frac{1}{4}$  in. by sixteenths to  $1\frac{1}{8}$  in., and from  $1\frac{1}{8}$  in. by eighths to 2 in., any depth not exceeding  $\frac{3}{4}$  in., at the rate of one inch per minute, any length required, and take any size shaft from  $\frac{3}{4}$  in. to 6 in. in diameter.

To use it as a PORTABLE KEY-SEATER, disconnect two bolts from the stand of the Continuous Key-Way Cutter and apply Yoke and Crank and you have a No. 2 PORTABLE KEY-SEATER, that will mill any size shafting from 2 in. to 8 in. in diameter the following widths, viz.: From  $\frac{1}{4}$  in. by sixteenths to  $1\frac{1}{8}$  in., and from  $1\frac{1}{8}$  in. by eighths to 2 in., any depth not exceeding  $\frac{3}{4}$  in., and this machine is provided with either automatic or hand feed while cutting, and has an indicator to show the depth cut in shaft. The machine will mill 6 in. before it is necessary to move the base forward on the shaft. An operator can easily cut a key-seat 12 in. long by  $\frac{5}{8}$  in. wide 5-16 in. deep in one hour by hand, and other sizes in proportion.

**Price** COMBINATION MACHINE complete, with counter shaft and full set cutters boxed, **\$200.00 Net.**  
Weight, net 400 lbs.; boxed 500 lbs.; measurements, 22 in. x 31 in. x 48 in.

**GALVANIZED FIRE PAILS.**

Painted Red Outside, Flat Bottoms. For  
Factories, Warehouses and Steamboats.

Quarts .....	10	12	14
Per gross.....			

In ordering always mention whether the  
plain galvanized or painted fire pails are desired.

**GALVANIZED FIRE PAILS.**

Painted Red Outside. Round Bottoms.

Quarts .....	10	12	14
Per gross.....			

In ordering always mention whether the  
plain galvanized or painted fire pails are desired.

**GALVANIZED OIL AND GASOLINE CANS—McNutt.**

Strong, Serviceable, Air-Tight.

Patent Stamped Tin Breast and Galvanized  
Bottom and Body.

2 Gallon.....	per gross,
3    "    .....	"
5    "    .....	"

Every Can Tested by Compressed Air and  
guaranteed to be tight.

The 5-gallon has Iron Breast, Bottom and  
Body.

2 and 3 gallon, crated, 1 dozen in a crate.

5	"	"	$\frac{1}{2}$	"	"	"
---	---	---	---------------	---	---	---

Approximate weight per dozen, including crates. { 2 gallon, 37 lbs.  
3    "    41    "  
5    "    70    "

### Galvanized Oil Tanks—The Competitor.



The body and bottom of this tank are made of Galvanized Iron, and the hood of Heavy Tin Plate. Constructed in nearly all respects like the Winchell's Patent Tank. Made of Galvanized Iron and Japanned. Has a Wood Bottom, also a stationary Drip Pan and a Removable Pump, with an upright handle. It is introduced to meet the demand for a cheap Tank.

Capacity 30 gallon.....each,

“ 60 “ ..... “

With Measures and Funnels..... “

### Galvanized Oil Tank—The Perfection.



This Tank is the same as the Winchell's Patent Tank with the exception of the Drip Pan, which is stationary. Pump fitted with Brass Valves, Steel Rod and Brass Tube outlet. In all respects a first-class Tank.

Capacity 60 gallon.....each,

With Measures and Funnels.....





## DIXON'S

Pure Flake

### Lubricating Graphite

Largely increases the efficiency of all oils and greases and reduces friction successfully where all other lubricants fail.

No. 632—	1 lb. cans,	20 cts. each.
" 633—	5 " tin cans,	85 " "
" 634—	10 " "	\$1.60
" 644—	25 " boxes,	15 cts. per lb.
" 645—	50 " "	14½ " "
" 646—	100 " kegs,	14 " "
" 647—	350 " bbls.	12 " "

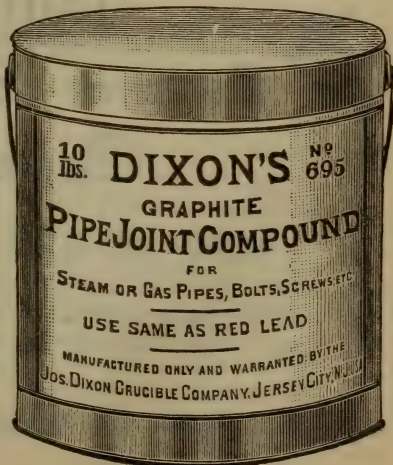
## DIXON'S

Graphite

### Pipe=Joint Compound

Far better and cheaper than Red Lead. Indispensable for Gas Companies, Railroads, for Manufacturers of all Kinds, for Plumbers. Steam Fitters, Machinists, Engineers, Manufacturers' Radiators, Etc., Boiler and Engine Makers, Quarries, Mining Companies, Etc.

No. 693—	1 lb. package,	20 cts. per lb.
" 694—	5 " "	18 " "
" 695—	10 " "	15 " "
" 696—	25 " "	14 " "
" 697—	50 " "	13½ " "
" 698—	100 " "	12 " "



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# CALLAHAN'S

## ***"Old Reliable" Pipe Joint Cement.***

In Screw or Flange Joints, for Water, Hot or Cold, Oil, Gas or Chemicals. Will cure leaking tanks. Fifteen years established reputation. Price, 40 cents per lb.

## ***Callahan's Rubber Roof Cement.***

Will stick to a wet roof. Never gets hard in packages. Price, 6c. per lb.

## ***Callahan's Elastic and Durable Paint Oil.***

For roof painting. Superior to linseed oil for roofing. Price, 7c. per lb.

## ***Callahan's Non-Corrosive and Non-Poisonous Soldering Fluid.***

\$2.00 per gallon.

## ***Callahan's Anti-Slip Belt Dressing.***

Instantly stops all slipping belts. A perfect leather preservative. Price, 50c. per lb.

---



## KOHLBRAND

## Anchor Steam

## Boiler Compound.

---

THE ONLY ANTI-INCRUSTATOR IN THE WORLD.

---

THIS COMPOUND IS SOLIDIFIED IN ONE POUND CANS. EACH CAN IS A WEEK'S DOSE. PUT UP IN 25, 50 AND 100 POUND PACKAGES.

---

**PRICE, NET, 25 CENTS PER POUND.**

## WITT'S CORRUGATED CAN

For Waste of All Kinds

Meets the demand in factories for a strong, easily handled can. Body is one piece—No. 23 gauge steel—so corrugated that a flat margin is left at both top and bottom to which the bands are riveted; corrugations are 2 in. on centers and extend entirely around the can. Heavy steel bands around top and bottom. Strongest and most durable can made. Lids and bottom are one piece each, stamped out of No. 21 steel. Lids fit close, making can air tight. Entire can galvanized after being made. Made in three sizes:

No. 1, 15 $\frac{3}{4}$ x 26 in.	No. 2, 18 x 26 in.	No. 3, 20 $\frac{1}{2}$ x 26 in.
Weight, 26 lbs.	28 lbs.	30 lbs.



## WITT'S CORRUGATED PAIL

A Small Reproduction of Witt's Can.



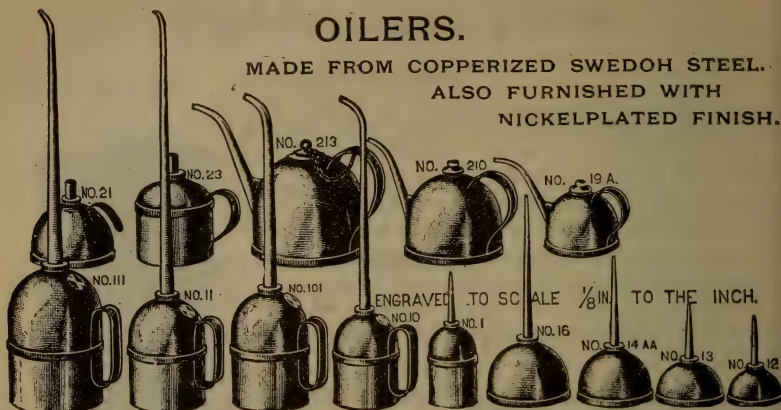
Its close fitting lid and the material of which it is made makes it an air-tight fire-proof vessel for holding temporarily, garbage and ashes. It is also better, stronger, and more economical than the ordinary bucket for servants, janitors, stablemen, etc. Used as a slop bucket, scrub bucket, and for any purpose which a bucket may be used. Made in two sizes:

No. 7, 11 x 13 in.	No. 8, 13 x 13 in.
Capacity, 5 gals.	Capacity, 7 gals.

**Further Information and Prices on Application.**

## OILERS.

MADE FROM COPPERIZED SWEDISH STEEL.  
ALSO FURNISHED WITH  
NICKELPLATED FINISH.



## R. R. OILERS.

Number.	Capacity.	Diameter. Inches.	Height. Inches.	Nozzle. Inches.	Price per doz.
10	1 pint.	3 $\frac{3}{8}$	5	12	14.00
11	1 quart.	4 $\frac{1}{8}$	6	18	18.00
17	1 pint.	3 $\frac{3}{8}$	5	12	18.00
18	1 quart.	4 $\frac{1}{8}$	6	18	21.00
101	1 "	4 $\frac{1}{8}$	6	10	18.00
111	2 "	5	8.	10 or 14	20.00

## TEXTILE MILL SYPHON OILERS.

Number.	Capacity.	Diameter. Inches.	Height. Inches.	Nozzle. Inches.	Price per doz.
1	$\frac{1}{2}$ pint	2 $\frac{1}{2}$	4 $\frac{1}{2}$	3	48.00
2	$\frac{3}{4}$ "	2 $\frac{11}{16}$	5	5	52.00

## LAMPS—Single Burner.

Number.	Capacity.	Diameter. Inches.	Price.
20	$\frac{1}{2}$ pint	3 $\frac{3}{8}$	6.00
20 $\frac{1}{2}$	$\frac{1}{2}$ "	3 $\frac{3}{8}$	9.00
21	1 "	4 $\frac{1}{8}$	12.00
22	1 "	3 $\frac{3}{4}$	9.00
23	1 $\frac{1}{2}$ "	4	12.00

## OILERS.

Number.	Capacity.	Diameter. Inches.	Nozzle. Inches.	Price per doz
12	$\frac{1}{4}$ pint	2 $\frac{3}{4}$	2 $\frac{1}{2}$	4.50
13	$\frac{1}{2}$ "	3 $\frac{1}{8}$	3	5.50
13 A	$\frac{1}{2}$ "	3 $\frac{3}{8}$	5	6.00
14	$\frac{1}{2}$ "	3 $\frac{3}{8}$	9	6.50
14 A	$\frac{1}{2}$ "	3 $\frac{3}{8}$	3	7.50
14 AA	$\frac{1}{2}$ "	3 $\frac{3}{8}$	5	8.00
14 B	$\frac{1}{2}$ "	3 $\frac{3}{8}$	9	8.50
15	1 "	4 $\frac{1}{8}$	3	9.25
15 A	1 "	4 $\frac{1}{8}$	5	9.75
16	1 "	4 $\frac{1}{8}$	9	10.50

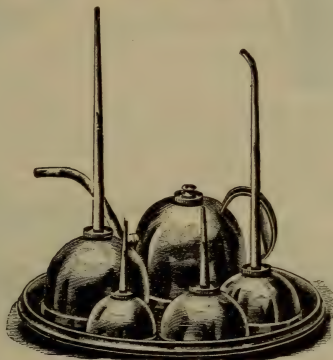
## FILLERS—Screw Top.

Number.	Capacity.	Diameter. Inches.	Nozzle. Inches.	Price per doz
19	1 pint	4 $\frac{1}{8}$	3 $\frac{1}{2}$	14.00
19 A	1 $\frac{1}{2}$ "	4 $\frac{1}{4}$	4	17.00
210	1 qt.	5	5	20.00
211	2 "	6	6	24.00



## ENGINEERS' OILER SETS.

MADE OF COPPERIZED SWEDOH STEEL.



## WITH ROUND TRAY.

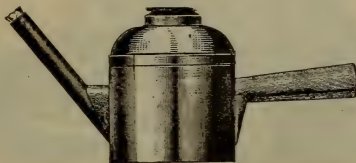
No.					Per Set.
30W.	Five Pieces,	"Copperized Swedoh" Steel (counting Tray)	.....		5.00
40W.	Six	"	"	"	7.00
50W.	Five	Nickelplated	"	"	7.00
60W.	Six	"	"	"	10.00

## WITH OVAL TRAY.

35W.	Five Pieces,	"Copperized Swedoh" Steel	.....	7.00
45W.	Six	"	"	10.00
55W.	Five	Nickelplated	"	8.00
65W.	Six	"	"	11.00

## Locomotive or Engineers Torches.

DURABLE—NON-EXPLOSIVE.



No. 27.

## COPPER PLATED.

No. 26.	1-pint, 2 inch diameter, 15 inch high, Brass Cap and Tube, per doz	\$12 00
No. 27.	1½-pint, 2 inch diameter, 4½ inch high, Brass Cap and Tube, per doz	12 00
No. 28.	1-quart, 4 oz., 5¼ inch diameter, 4¼ inch high, Brass Cap and Tube, per doz	15 00



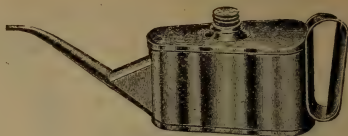
No. 110.

Engineers Torch,  
per doz., \$9 00



PERFECTION FILLER CANS.

	Tin, per doz.	Brass, per doz.	Nickel, per doz.
No. 40. 1 pt.....	\$10 00	\$15 00	18 00
No. 41. 1 qt.....	12 00	18 00	21 50
No. 42. 2 qt.....	14 50	21 00	27 00
No. 44. 4 qt.....	18 00	with bail 30 00	42 00



## ENGINEERS' HAND OILERS.

	Tin, per doz.	Brass, per doz.	Nickel, per doz.
No. 250. $\frac{1}{2}$ pt . . . . .	\$ 5 00	\$ 9 00	\$12 00
No. 270. 1 pt . . . . .	6 00	10 50	13 50
No. 290. 1 qt . . . . .	9 00	15 00	18 00
No. 310. 2 qt . . . . .	15 00	21 00	24 00



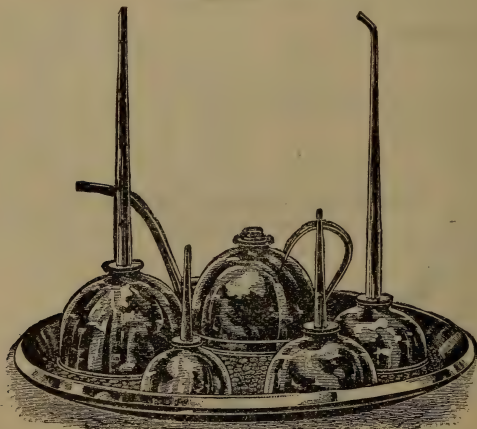
PERFECTION HAND OILERS.

	Tin, per doz.	Brass, per doz.	Nickel, per doz.
No. 25. $\frac{1}{2}$ pt. ....	\$ 8 00	\$12 00	\$14 50
No. 27. 1 pt. ....	9 00	13 50	17 00
No. 29. 1 qt. ....	12 00	18 00	22 50
No. 31. 2 qt. ....	18 00	25 00	30 00



BENZINE CANS.

	Tin, per doz.	Brass, per doz.
No. 10C .....	\$12 00	\$18 00
No. 104. ....	15 00	24 00



ROUND TRAY.

No. 30 K.	Five pieces, brass (counting tray) ..	6.00	No. 50 K.	Five pieces, nickel (counting tray) ..	8.00
No. 40 K.	Six " " " " " "	9.00	No. 60 K.	Six " " " " " "	11.00

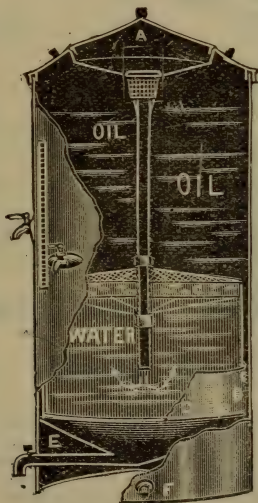
These Engineers' Sets are made of heavy brass and handsomely finished.

# ACME OIL FILTER.

## ...DESCRIPTION...

It is built of heavy galvanized iron, the filtering materials employed are animal boneblack or charcoal, recognized by the oil refiners as the best oil filtering medium extant.

Nos. 1, 2, 3 and 4 have steam connections, inducing greater and more effective filtering capacity. In accompanying figure "A" is receptacle for oil to be filtered, the oil falls by its own weight, rises by gravity through water and filtering material (immersed in water) and is drawn off from faucets as shown. "C" indicates filtering material and its location. "D" is pan that catches dirt precipitated by oil coming in contact with water. "E" is double bottom or steam chamber for heating the water in Nos. 1, 2 and 3. No. 4 is equipped with steam coil in bottom. "F" is inlet outlet is on reverse side for steam for heating filter.



*We use  
Animal  
Boneblack,  
the  
best  
known  
Filtering  
Medium.*

*We do  
not use  
Cotton  
Waste,  
which soon  
becomes  
Foul and  
Inefficient*

## NET PRICE LIST.

No.	Gallons Capacity	FILTERS Gallons every 24 hours	PRICE.
0	7	1½ to 2	\$15 00
1	10	3 to 4	20 00
2	25	4 to 7	30 00
3	50	10 to 16	40 00
4	100	25 to 35	75 00

*No. 0 has no Steam Connections.*

Nos. 1, 2 and 3 have double bottoms as shown in cut, for admission of steam; No. 4 is equipped with wrought iron coil, located in the double bottom.

Steam attachment will increase filtering capacity about 10 per cent. Nos. 0, 1, 2 and 3 are kept constantly on hand; No. 4 is made on order only.

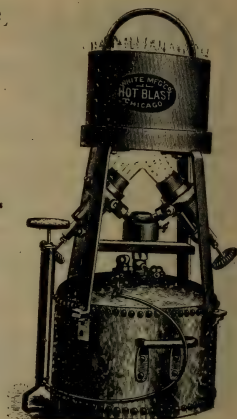
**No. 91.—White's <sup>TRADE</sup> "Hot Blast" <sup>MARK</sup> Giant Portable Melting Furnace.**

**FOR GASOLINE.**

Will melt 100 pounds Zinc Lead or Babbitt in 20 minutes.

**NO FACTORY IS COMPLETE WITHOUT ONE OF THESE MACHINES.**

Height.....	39 inches
Weight.....	145 pounds
Capacity.....	10 gallons
Price.....	\$60.00 each
13½ inch Melting Pot.....	\$4.00 each



NO. 91.

**Every Shop Should Have One of These Machines.**

**No. 48.—Giant Brazer Gasoline.**

Height.....	40 inches
Weight.....	100 pounds
Consumes 3½ gallons in.....	10 hours
Capacity.....	10 gallons
Price, each.....	\$32.00



NO. 48.

**No. 45.—Combination Brazer and Forge, Gasoline.**

Height.....	38 inches
Weight.....	80 pounds
Capacity.....	10 gallons
Consumes 3 gallons in.....	10 hours
Price, each.....	\$31.00



NO. 45.



# Gasoline TRADE "Hot Blast" MARK Blow Torches.



NO. 23

No. 23.—Electric Torch.

Height.....8 inches

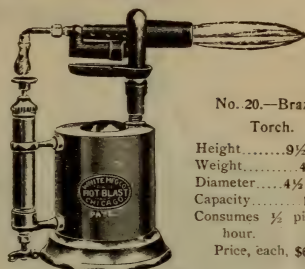
Weight.....2 lbs.

Diameter.....3½ inches

Capacity.....1½ pints

Consumption ¼ pint per hour

Price, each, \$4.50



NO. 20

No. 20.—Brazers  
Torch.

Height.....9½ inches

Weight.....4½ lbs.

Diameter.....4½ inches

Capacity.....1 quart

Consumes ½ pint per  
hour.

Price, each, \$6.00



NO. 21

No. 21.—Combination Torch.

Height.....10 inches

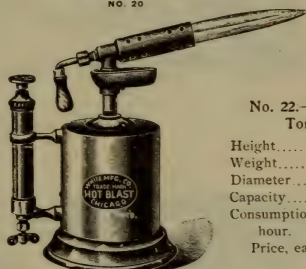
Weight.....4 lbs.

Diameter.....4½ inches

Capacity.....1 quart

Consumption ½ pint per hour

Price, each, 5.50



NO. 22

No. 22.—Imperial  
Torch.

Height.....9 inches

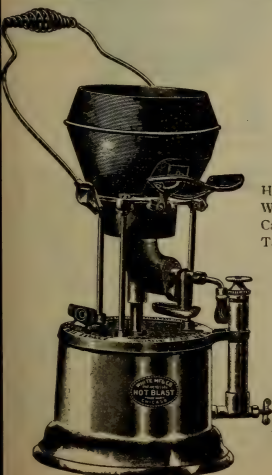
Weight.....3 lbs.

Diameter.....4½ inches

Capacity.....1 quart

Consumption ½ pint per  
hour.

Price, each, \$5.00



NO. 31

## Gasoline Furnaces.

No. 31.—Combination Furnace.

Height.....16 inches

Weight.....9½ lbs.

Capacity.....1 gallon

Tank.....18 gauge brass

Not effected by wind or rain.

Price, each, \$8.50

No. 42.—Pioneer Coil Furnace.

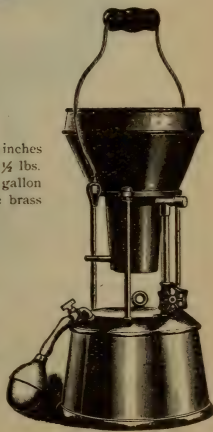
Height.....17¾ inches

Weight.....9½ lbs.

Capacity.....1 gallon

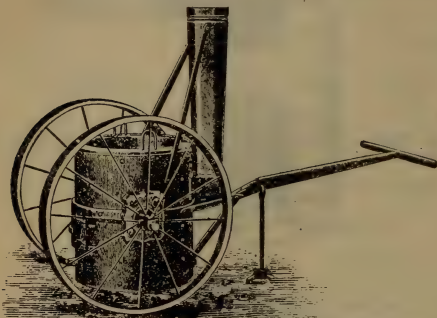
All parts interchangeable with H. J. & C.  
pattern.

Price, each, \$4.50



NO. 42

## WATER WORKS TOOLS.



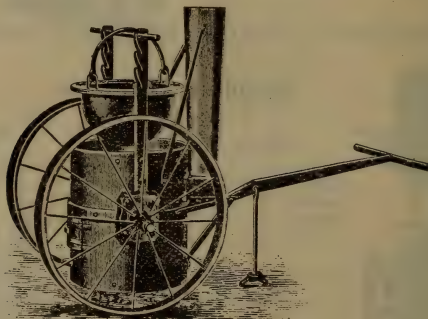
L-445. CLOW'S IMPROVED MELTING FURNACE ON WHEELS.



L-448. CLOW'S IMPROVED MELTING FURNACE ON LEGS.

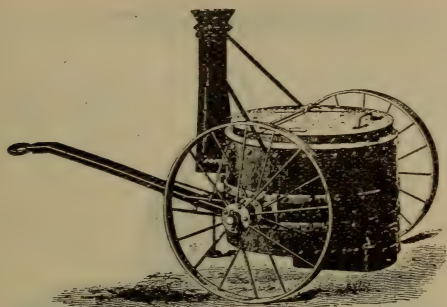
NUMBER . . . . .		1	2
ON LEGS . . . . .	EACH	35.00	30.00
ON WHEELS . . . . .	EACH	50.00	45.00
ON WHEELS, WITH GASOLINE BURNER AND RESERVOIR ATTACHMENT . . . . .	EACH	75.00	70.00

The No. 1 Furnaces are the standard size, and can be used on the largest work, while the No. 2 are designed for lighter service.



NUMBER 1 . . . . .	EACH	58 00	NUMBER 2 . . . . .	EACH	52 00
--------------------	------	-------	--------------------	------	-------

Hinged Covers for Pots furnished to order Add to list No 1, \$5.00; No. 2, \$3.50.  
Descriptive catalogue of Melting Furnaces will be sent upon application.



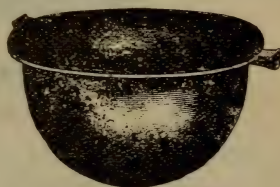
TAR MELTING FURNACES.—L-455.

PRICE, COMPLETE . . . . .	125.00
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Designed to meet the requirements for a thoroughly reliable Tar Melting Furnace. Like our Lead Melting Furnaces, it is constructed of the best material, and gives excellent satisfaction.  
Send for Catalogue of Melting Furnaces.



STEAM JACKET KETTLE.



CALDRON KETTLE.

STEAM JACKET KETTLES.—L-457.

CAPACITY . . . . .	GALLONS	5	10	15	20	25	33	40	58	90
DIAMETER . . . . .	INCHES	14	18	21	22	24	28	29	32	38
DEPTH . . . . .	INCHES	10	12	14	15	16	16	17	21	22
PRICE . . . . .	EACH	20 00	28 00	32 00	40 00	50 00	60 00	65 00	85 00	110 00

These Kettles are made of very thick metal, put together without stay-bolts, have ample steam space, are packed with asbestos sheet packing, tapped for inlet and drip pipes, and unless ordered for higher pressure are tested to 75 pounds hydro-lic pressure to the square inch, and are guaranteed perfect and safe for the pressure named.

CALDRON KETTLES.—L-459.

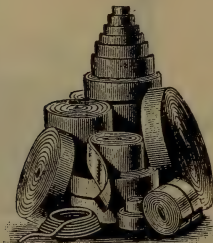
CAPACITY . . . . .	GALLONS	25	33	41	48	53	65	75	90	110	170	230
DIAM. OUTSIDE OF FLANGE . . . . .	INCHES	28	31	34	35	36	39	41	43	46	61	62 1/2
DIAM. INSIDE OF FLANGE . . . . .	INCHES	24	28	30	31	32	34	36	38	42	54	58
DEPTH . . . . .	INCHES	16	16	19	19	20	20 1/2	22	22	23	24	31
PRICE . . . . .	EACH	6 00	8 01	10 00	12 00	13 00	14 00	18 00	25 00	30 00	50 00	70 00

All sizes above 75 gallons are cast without lugs on rim unless specially ordered.

Any of the above Kettles may be tapped for outlet pipes at an extra charge of \$2.50 net.

We can make any of our Kettles of any desired thickness of metal on short notice.

## LEATHER BELT.



We strictly maintain the grade of our leather belting, and our customers can depend upon receiving exactly the quality called for by their order. We furnish three grades : The several grades furnished by us are fully guaranteed to be of the quality represented. In sending for estimates, state quality desired.

### PRICE PER LINEAL FOOT.

Subject to Discount.

1 -inch.....\$0 14	6 -inch.....\$1 11	21-inch.....\$3 89
1¼ " ..... 19	6½ " ..... 1 20	22 " ..... 4 07
1½ " ..... 24	7 " ..... 1 30	24 " ..... 4 44
1¾ " ..... 29	8 " ..... 1 48	25 " ..... 4 63
2 " ..... 34	9 " ..... 1 67	26 " ..... 4 81
2¼ " ..... 39	10 " ..... 1 85	27 " ..... 5 00
2½ " ..... 43	11 " ..... 2 04	28 " ..... 5 18
2¾ " ..... 48	12 " ..... 2 22	30 " ..... 5 55
3 " ..... 53	13 " ..... 2 41	32 " ..... 5 92
3¼ " ..... 58	14 " ..... 2 59	34 " ..... 6 29
3½ " ..... 63	15 " ..... 2 78	35 " ..... 6 48
3¾ " ..... 67	16 " ..... 2 96	36 " ..... 6 66
4 " ..... 72	17 " ..... 3 15	40 " ..... 7 40
4½ " ..... 82	18 " ..... 3 33	44 " ..... 8 14
5 " ..... 91	19 " ..... 3 52	48 " ..... 8 88
5½ " ..... 1 01	20 " ..... 3 70	

Double belts twice the price of single.

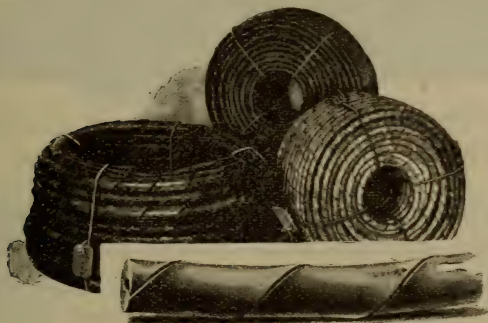
For table of horse-power of belting, see Engineering Notes,



## TWIST LEATHER BELTING

## PRICE LIST

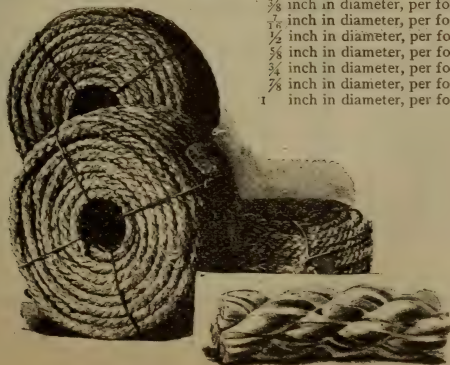
$\frac{1}{8}$ inch in diameter, per foot	\$0 08	$\frac{1}{2}$ inch in diameter, per foot	\$0 38
$\frac{1}{4}$ inch in diameter, per foot	12	$\frac{3}{8}$ inch in diameter, per foot	48
$\frac{3}{8}$ inch in diameter, per foot	17	$\frac{1}{2}$ inch in diameter, per foot	60
$\frac{1}{2}$ inch in diameter, per foot	22	$\frac{3}{4}$ inch in diameter, per foot	80
$\frac{3}{4}$ inch in diameter, per foot	27	1 inch in diameter, per foot	96

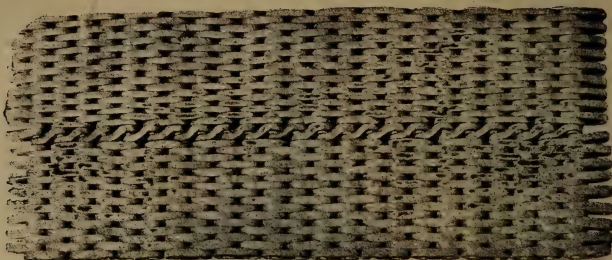


## RAW HIDE ROPE

## PRICE LIST

$\frac{1}{4}$ inch in diameter, per foot	\$0 18	$\frac{3}{8}$ inch in diameter, per foot	\$0 24
$\frac{1}{2}$ inch in diameter, per foot	21	$\frac{1}{2}$ inch in diameter, per foot	27
		$\frac{3}{4}$ inch in diameter, per foot	30
		$\frac{1}{2}$ inch in diameter, per foot	36
		$\frac{3}{4}$ inch in diameter, per foot	46
		$\frac{1}{2}$ inch in diameter, per foot	60
		1 inch in diameter, per foot	72





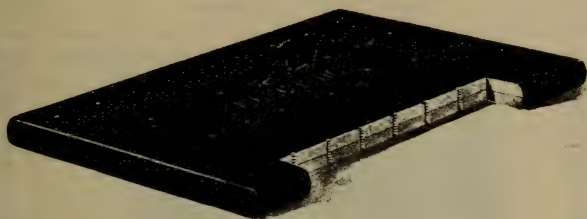
**NET PRICE LIST OF AMERICAN PATENT  
JOINT LEATHER LINK BELTING  
PER RUNNING FOOT**

Width of Belt Inches	FACTORY SIZES		DYNAMO SIZE	FOR EXTRA HEAVY WORK	
	7-16 Inch Thick	9-16 Inch Thick	11-16 Inch Thick	¾ Inch Thick	1 Inch Thick
1	\$0 20	\$0 20	\$0 25	\$0 30	\$0 35
1½	30	30	38	45	52
2	40	40	50	60	70
2½	50	50	63	75	87
3	60	60	75	90	1 05
3½	70	70	88	1 05	1 22
4	80	80	1 00	1 20	1 40
4½		90	1 13	1 35	1 57
5		1 00	1 25	1 50	1 75
5½		1 10	1 38	1 65	1 92
6		1 20	1 50	1 80	2 10
7		1 40	1 75	2 10	2 45
8		1 60	2 00	2 40	2 80
9			2 25	2 70	3 15
10			2 50	3 00	3 50
11			2 75	3 30	3 85
12			3 00	3 60	4 20
13			3 25	3 90	4 55
14			3 50	4 20	4 90
15			3 75	4 50	5 25
16			4 00	4 80	5 60
18			4 50	5 40	6 30
20			5 00	6 00	7 00
22			5 50	6 60	7 70
24			6 00	7 20	8 40
26			6 50	7 80	9 10
30			7 50	9 00	10 50
36			9 00	10 80	12 60

Can be made absolutely waterproof without extra charge.

The patent joint or hinge is not put in belts narrower than four inches unless by special request and at special prices.

## PATENT PERFORATED ELECTRIC LEATHER BELTING



The patent wire screw fastenings which are put in our Electric Belts bind the leather firmly together and leave the surface of the belt perfectly smooth, so that it can be run at pleasure on either side; nor do they make the belt stiff and clumsy, as when riveted, pegged or sewed with wax thread or lacing. They cannot be worn off.

We claim that our Electric is the most perfect and reliable belt ever introduced, and deserves the attention of all consumers of Leather Belting. We give a full guarantee with every belt.

### DOUBLE ELECTRIC AND PERFORATED BELTING

POSITIVELY NET LIST FOR DOUBLE-PLY BELTING. ADOPTED NOV. 15, 1899

Width Inches	Price per Foot	Width Inches	Price per Foot	Width Inches	Price per Foot	Width Inches	Price per Foot
1	\$0 15	7	\$1 43	18	\$3 66	36	\$7 33
1½	26	8	1 63	20	4 07	40	8 14
2	37	9	1 84	22	4 48	44	8 95
2½	47	10	2 04	23	4 69	48	9 77
3	58	11	2 24	24	4 88	52	10 58
3½	69	12	2 44	26	5 29	56	11 40
4	79	13	2 65	28	5 70	60	12 21
4½	90	14	2 85	30	6 11	64	13 02
5	1 00	15	3 06	32	6 51	68	13 84
6	1 21	16	3 26	34	6 92	72	14 65

N. B.—These belts are all double-ply. When ordering, state if belts run at high or low speed.

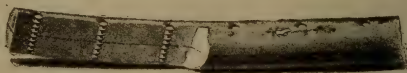
We perforate belts without extra charge for high speed when desired.

## THE GANDY BELT PRICE LIST.

4-PLY.		6-PLY.		8-PLY.		10-PLY.	
1½ inch...\$	13½ per ft.	3 inch...\$	36 per ft.	6 inch....\$	90 per ft.	12 inch....\$	2 40 per ft.
1¼ " ...	15¼ "	3½ " ...	42 "	7 " ....	1 05 "	14 " ....	2 80 "
2 " ...	18 "	4 " ...	48 "	8 " ....	1 20 "	15 " ....	3 00 "
2¼ " ...	20¼ "	4½ " ...	54 "	9 " ....	1 35 "	16 " ....	3 20 "
2½ " ...	22½ "	5 " ...	60 "	10 " ....	1 50 "	18 " ....	3 60 "
2¾ " ...	24¾ "	6 " ...	72 "	11 " ....	1 65 "	20 " ....	4 00 "
3 " ...	27 "	7 " ...	84 "	12 " ....	1 80 "	22 " ....	4 40 "
3½ " ...	31½ "	8 " ...	96 "	14 " ....	2 10 "	24 " ....	4 80 "
4 " ...	36 "	9 " ...	1 08 "	15 " ....	2 25 "	26 " ....	5 20 "
5 " ...	45 "	10 " ...	1 20 "	16 " ....	2 40 "	28 " ....	5 60 "
6 " ...	54 "	12 " ...	1 44 "	17 " ....	2 55 "	30 " ....	6 00 "
7 " ...	63 "	13 " ...	1 56 "	18 " ....	2 70 "	36 " ....	7 20 "
8 " ...	72 "	14 " ...	1 68 "	20 " ....	3 00 "	40 " ....	8 00 "
9 " ...	81 "	15 " ...	1 80 "	24 " ....	3 60 "	44 " ....	8 80 "
10 " ...	90 "	16 " ...	1 92 "	30 " ....	4 50 "	48 " ....	9 60 "
11 " ...	99 "	17 " ...	2 04 "	36 " ....	5 40 "	54 " ....	10 80 "
12 " ...	1 08 "	18 " ...	2 16 "	40 " ....	6 00 "	60 " ....	12 00 "

## WIRE-SCREWED SOLID ROUND BELTING

We are now making a solid round leather belt made from several pieces of leather cemented together, and fastened with our copper wire screws, which are forced into the leather, and make the belt firm and solid, so that it cannot work apart.



This illustration shows how firmly the screws hold the leather

are forced into the leather, and make the belt firm and solid, so that it cannot work apart.

## PRICE LIST

7/16 inch in diameter, per foot	50 23	1¼ inches in diameter, per foot	\$1 00
½ inch in diameter, per foot	25	1½ inches in diameter, per foot	1 35
5/8 inch in diameter, per foot	36	1¾ inches in diameter, per foot	1 75
¾ inch in diameter, per foot	46	2 inches in diameter, per foot	2 15
7/8 inch in diameter, per foot	60	2¼ inches in diameter, per foot	2 55
1 inch in diameter, per foot	72	2½ inches in diameter, per foot	2 95
1¼ inches in diameter, per foot	85		

## SOLID ROUND BELTING



Diameter Inches	Price Per Foot
1½	\$0 07
1¾	09
2	14
2¼	18
2½	24



# "GIANT BELTING"

Seamless and Stitched."

(REGISTERED TRADE MARK.)



**The Original Stitched Belt.**

**The Best Belt Ever Made.**

**THIS BELT IS MORE ECONOMICAL  
THAN ANY OTHER.**

The plies are strongly frictioned and stitched together and cannot separate.

It runs perfectly true on the pulleys.

Either side can be run next to the pulley, both being perfectly smooth.

The cover, being seamless, cannot break or crack.

An 8-inch 4-ply endless belt parted ten feet from the splice, under about 9,500 lbs. tensile strain, thus showing the strength of the belt and splice.

It will transmit more power than any other belt.

It will give satisfaction where other belts have failed.

At double the cost it is better value than any other kind of rubber or duck belting.

We guarantee it to be equal to leather for straight driving belt in dry places, while the average cost is one third less.

## GIANT BELTING

(Continued)

In damp places it is far superior.

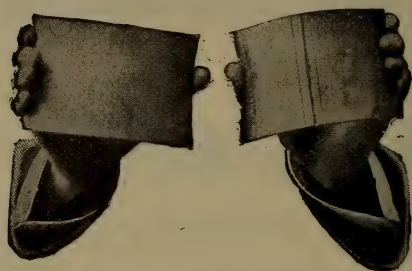
The **greatest evidence** of the worth of this belt is shown by our competitors continually, but unsuccessfully, attempting to imitate or improve upon it.

It has practically no stretch. It will save vexatious delays and loss of time and money.

List price same as on regular rubber belting.

## SEAMLESS BELTING

"SHAWMUT," (Not Stitched)



New Style "Seamless."

Old Style Seam.

This belting is made of a heavy, close-woven duck and high-grade rubber. After making seamed belts for a long time, we discarded that method many years ago, and now make our belting **seamless**. A long experience shows that the life of a seamless belt far exceeds that of the old style seamed belt.

Either side can be run next to the pulley.

All of our belting is made with a **smooth surface**, and is thoroughly **stretched**.

Special orders for belting of any thickness and width (up to 99 inches) can be executed within a week from receipt of the order.

# RUBBER BELTING.



## REGULAR LIST

(All Brands)

Inch.	2 Ply.	3-Ply.	4-Ply.	5-Ply.	6-Ply.	7-Ply.	8-Ply.
1	\$0 07	\$0 09	\$0 11				
1 $\frac{1}{4}$	09	11	13				
1 $\frac{1}{2}$	11	13	15	\$0 19			
1 $\frac{3}{4}$	13	15	17	21			
2	15	17	21	26	\$0 31		
2 $\frac{1}{2}$	18	22	26	32	39		
3	22	26	31	38	46		
3 $\frac{1}{2}$	26	30	37	46	55		
4	30	34	42	52	63	\$0 73	
4 $\frac{1}{2}$	33	39	47	58	70	82	
5	36	43	52	65	78	91	
6	43	52	62	77	93	1 08	\$1 24
7	51	60	73	91	1 09	1 27	1 46
8	59	70	84	1 05	1 26	1 47	1 68
9	67	80	95	1 18	1 42	1 66	1 90
10	75	90	1 07	1 33	1 60	1 87	2 14

## RUBBER BELTING

## REGULAR LIST

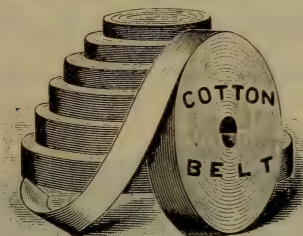
*(Continued)*

Inch.	2-Ply.	3-Ply.	4-Ply.	5-Ply.	6-Ply.	7-Ply.	8-Ply.
11	\$0 83	\$1 00	\$1 18	\$1 47	\$1 77	\$2 06	\$2 36
12	91	1 08	1 30	1 62	1 95	2 27	2 60
13	1 00	1 18	1 42	1 77	2 13	2 48	2 84
14	1 08	1 28	1 54	1 92	2 31	2 69	3 08
15	1 16	1 38	1 66	2 07	2 49	2 90	3 32
16	1 25	1 50	1 78	2 22	2 67	3 11	3 56
18	1 41	1 70	2 02	2 52	3 03	3 53	4 04
20	1 58	1 90	2 26	2 82	3 39	3 95	4 52
22	1 76	2 12	2 52	3 15	3 78	4 41	5 04
24	1 96	2 36	2 80	3 50	4 20	4 90	5 60
26	2 16	2 60	3 08	3 85	4 62	5 39	6 16
28	2 36	2 84	3 36	4 20	5 04	5 88	6 72
30			3 64	4 55	5 46	6 37	7 28
32			3 92	4 90	5 88	6 86	7 84
34			4 20	5 25	6 30	7 35	8 40
36			4 48	5 60	6 72	7 84	8 96
38			4 76	5 95	7 14	8 33	9 52
40			5 04	6 30	7 56	8 82	10 08
42			5 32	6 65	7 98	9 31	10 64
44			5 60	7 00	8 40	9 80	11 20
46			5 88	7 35	8 82	10 29	11 76
48			6 16	7 70	9 24	10 78	12 32
50			6 44	8 05	9 66	11 27	12 88
52			6 72	8 40	10 08	11 76	13 44
54			7 00	8 75	10 50	12 25	14 00
56			7 28	9 10	10 92	12 74	14 56
58			7 56	9 45	11 34	13 23	15 12
60			7 84	9 80	11 76	13 72	15 68



# RUSSELL COTTON BELTING.

The Best Cotton Belt Manufactured.



## PRICE LIST PER LINEAL FOOT.

Subject to Discount.

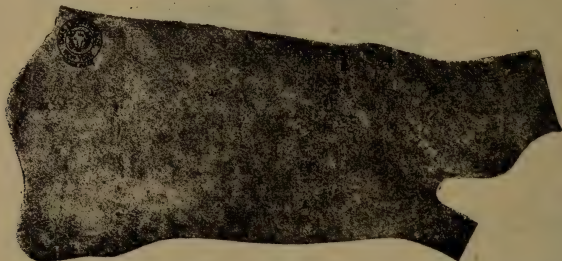
	2-Ply.	3-Ply.	4-Ply.	5-Ply.	6-Ply.	8-Ply.
1 inch.....	\$0 04	.....	.....	.....	.....	.....
1½ ".....	05	\$0 06	.....	.....	.....	.....
2 ".....	06	08	\$0 12	.....	.....	.....
2½ ".....	06½	10	14	.....	.....	.....
3 ".....	07	12	16	.....	.....	.....
3½ ".....	08	14	18	.....	.....	.....
4 ".....	09	15	21	\$0 34	.....	.....
4½ ".....	11	17	24	36	.....	.....
5 ".....	13	19	26	38	.....	.....
5½ ".....	15	21	28	40	.....	.....
6 ".....	17	23	30	42	\$0 46	\$0 75
7 ".....	19	27	34	45	51	83
8 ".....	21	31	38	50	57	91
9 ".....	23	35	44	56	66	1 03
10 ".....	26	39	50	63	75	1 15
11 ".....	30	45	55	69	.....	.....
12 ".....	33	48	60	75	90	1 35
14 ".....	41	60	75	94	1 12	1 65
16 ".....	49	72	90	1 12	1 35	1 95
18 ".....	57	82	1 00	1 28	1 50	2 13
20 ".....	61	90	1 15	1 44	1 72	2 33
22 ".....	65	1 00	1 35	1 62	1 94	2 60
24 ".....	69	1 10	1 55	1 80	2 16	2 85
26 ".....	.....	.....	1 75	2 00	2 36	3 15
28 ".....	.....	.....	1 90	2 15	2 60	3 35
30 ".....	90	.....	2 10	2 35	2 85	3 60
36 ".....	.....	.....	2 60	.....	.....	.....

## RAW HIDE LACE LEATHER

OUR WELL-KNOWN BRANDS

## TANNED LACE LEATHER

Our Tanned Lace Leather is unexcelled in color and finish, and is very tough, and retains its strength even after being on hand for a long



time. Every side is marked plainly with the number of square feet that it contains, and stamped with our trade-mark.

When lacing a belt observe the following:

A lace 15"	long, $\frac{1}{4}$ "	wide, will lace	1 $\frac{1}{2}$ "	belt, use No. 2 or 3	Oval Punch
A lace 24"	long, $\frac{5}{8}$ "	wide, will lace	2"	belt, use No. 3 or 4	Oval Punch
A lace 2 $\frac{1}{2}$ '	long, $\frac{5}{8}$ "	wide, will lace	2 $\frac{1}{2}$ "	belt, use No. 3 or 4	Oval Punch
A lace 3'	long, $\frac{5}{8}$ "	wide, will lace	3 & 3 $\frac{1}{2}$ "	belt, use No. 3 or 4	Oval Punch
A lace 3 $\frac{1}{2}$ '	long, $\frac{3}{8}$ "	wide, will lace	4"	belt, use No. 6 to 8	Oval Punch
A lace 4'	long, $\frac{3}{8}$ "	wide, will lace	4 $\frac{1}{2}$ & 5"	belt, use No. 6 to 8	Oval Punch
A lace 4 $\frac{1}{2}$ '	long, $\frac{3}{8}$ "	wide, will lace	5 $\frac{1}{2}$ & 6"	belt, use No. 6 to 8	Oval Punch
A lace 5'	long, $\frac{7}{8}$ "	wide, will lace	6 $\frac{1}{2}$ & 7"	belt, use No. 9 to 11	Oval Punch
A lace 5 $\frac{1}{2}$ '	long, $\frac{7}{8}$ "	wide, will lace	8"	belt, use No. 9 to 11	Oval Punch

For wider belts use  $\frac{1}{2}$ ",  $\frac{3}{8}$ " or  $\frac{3}{4}$ " lacing and No. 12 Punch.

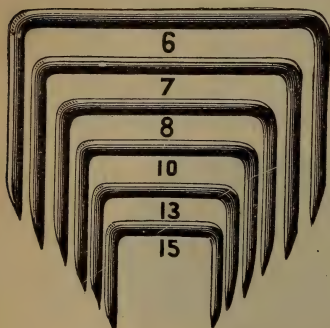
## LACE CUTTERS.



Price each, net.....\$0 50



## BUFFALO BELT FASTENERS.



### U. S. LETTERS PATENT.

February 2d, 1886.....	No. 335,187
March 27th, 1888.....	No. 380,104
March 27th, 1888.....	No. 380,105

### CANADIAN LETTERS PATENT.

September 7th, 1886.....	No. 24,906
October 29th, 1888.....	No. 30,052
October 29th, 1888.....	No. 30,053

GERMAN PATENT, March 27th, 1888.

FRENCH PATENT, March 27th, 1888.

ENGLISH PATENT, March 27th, 1888.

### NET PRICE LIST.

No.15-1000 in a box, \$1.50 per 1000

13-1000	"	2.00	"
10-1000	"	2.50	"
8- 500	"	3.50	"
7- 250	"	4.00	"
6- 250	"	5.00	"



This cut represents the manner in which the Fasteners should be used. After they are driven from one side and clinched, drive some from the side to which the first ones were clinched.

Curve the points with uniformity and drive them back into the belt. The Fastener, perfectly clinched, should be this shape.



This cut represents a very excellent feature of the Fasteners. An old belt may be repaired and made fully as strong as ever, and cut and torn belts may be fastened, no matter how they are torn. Remnants of old and new belting can be repaired, fastened together and used, while joints that are parting can be securely fastened. In an ordinary establishment large sums of money which are paid for new belting can be saved by using these Fasteners.

### SIZES TO USE.

For light, single and very small belts use No. 15. For ordinary single belts and general use, use No. 13. For extra heavy and wide single belts, and for small and light double belts, use No. 10. Nos. 13 and 10 may also be used on smaller sized 3 and 4-ply rubber and cotton belts. For ordinary double belts and wide 4-ply rubber and cotton, use No. 8. For extra heavy and wide double leather and rubber belts, Nos. 6 and 7 should be used.



## Crescent Belt Fastener Plates.

These plates are embossed or ribbed on scientific principles, adding to their strength and durability.

Even numbered plates are punched for small shank rivets and are intended for light and medium strains. For general use and heavy strains use the odd numbered plates, with large holes and large shank rivets.



No. 20 Plate,  
For Small Shank Rivets.  
 $\frac{3}{8}$  wide,  $\frac{1}{4}$  Gross Packages.  
Per gross, \$1.44



No. 21 Plate,  
For Large Shank Rivets.  
 $\frac{3}{8}$  wide,  $\frac{1}{4}$  Gross Packages.  
Per gross, \$1.44



No. 40 Plate,  
For Small Shank Rivets  
 $1\frac{1}{2}$ -16 wide,  $\frac{1}{4}$  Gross Package.  
Per gross, \$2.88



No. 47 Plate,  
For Large Shank Rivets.  
 $1\frac{1}{8}$  wide,  $\frac{1}{4}$  Gross Packages.  
Per gross, \$2.88



No. 44 Plate,  
For Small Shank Rivets.  
 $1\frac{1}{2}$  wide,  $\frac{1}{4}$  Gross Packages.  
Per gross, \$2.88



No. 70 Rivet Holder,  
For Small Shank Rivets.  
Per doz. 60

No. 72 For Large Shank Rivets,  
Per doz. 60

USE TWO OR MORE PLATES FOR WIDE BELTS.

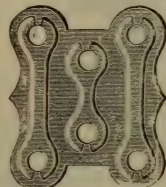
## Crescent Belt Fastener Plates.



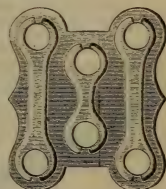
No. 60 Plate,  
 $1\frac{1}{2}$  wide.  
For Small Shank Rivets.  
 $\frac{1}{4}$  Gross Packages.  
Per gross, \$4.32



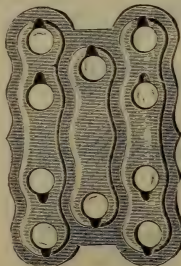
No. 63 Plate,  
 $1\frac{1}{2}$  wide.  
For Large Shank Rivets.  
 $\frac{1}{4}$  Gross Packages.  
Per gross, \$4.32



No. 66 Plate,  
 $1\frac{1}{2}$  wide.  
For Small Shank Rivets  
 $\frac{1}{4}$  Gross Packages.  
Per gross, \$4.32  
Note—Do not use this plate on pulleys of smaller diameter than five inches.



No. 67 Plate,  
 $1\frac{1}{2}$  wide.  
For Large Shank Rivets.  
 $\frac{1}{4}$  Gross Packages.  
Per gross, \$4.32  
Note—Do not use this plate on pulleys of smaller diameter than five inches.



No. 101 Plate,  
 $1\frac{1}{2}$  wide  
For Large Shank Rivets.  
 $\frac{1}{4}$  Gross Packages.  
Per gross, \$7.20  
Note—Do not use this plate on pulleys of smaller diameter than ten inches.

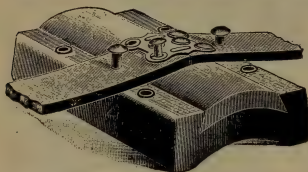
USE TWO OR MORE PLATES FOR WIDE BELTS.

# TOOLS.

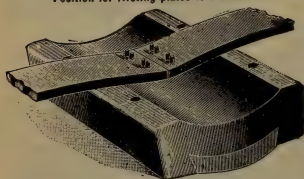
No. 74 Belt Holder.

Price \$1.00

For joining overhead belts and curving the plates.



Position for riveting plates to the belt.



Position for clinching rivets and curving plates.

Overhead belts can be joined without this device, by tacking the ends of the belt to a board or plank, using the straight edge of the board to keep the edges of the belt in line.

No. 75 Plain casting for clinching and curving only. Price 40c.

## No. 76 Instantaneous Rivet Extractor.



For Small Shank Rivets only. Price \$1.50.



## No. 78. Rivet Extractor and Cutting Nippers.

A well made and very powerful tool. Price, 8 inch \$1.00,  
6 inch 75 cents.

In using this tool, it should be given a twist after the rivet has been partly drawn out.

## Self Clinching Drive Rivets.

(FOR ATTACHING PLATES.)

STEEL BODY, COPPER PLATED.

No holes to punch or washer required. Drive the rivet with a hammer as you would a tack and clinch likewise, or spread the prongs after driving them through the belt by striking a piece of round metal placed between the prongs.

Rivets for leather and cotton belts should be  $\frac{1}{8}$  inch longer than thickness of belt. For rubber belts,  $\frac{5}{16}$  longer than thickness.

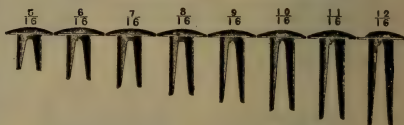
### SMALL SHANK RIVETS.

SLOTTED SAME DEPTH AS ILLUSTRATIONS.



### LARGE SHANK RIVETS.

SLOTTED SAME DEPTH AS ILLUSTRATIONS.



Prices of Rivets:— 1 off on six gross lots.

	SMALL SHANK.	LARGE SHANK
5, 6, 7 or 8 16 long under head	.50	.75
9 or 10 16 " " "	.60	.90
11 or 12 16 " " "	.70	1.05

## HANDY ASSORTMENTS.

**No. 4 Handy Assortment** contains three gross Small Shank Rivets, nine dozen assorted plates, with small holes, and two rivet starters. Adapted to single and light double leather belts and four to six ply rubber or cotton belts. Not suited to heavy work. Price, \$3.50.

**No. 5 Handy Assortment** contains three gross Large Shank Rivets, nine dozen assorted plates, with large holes, and two rivet starters. Adapted to single and heavy double leather and four to eight ply rubber or cotton belts. Price \$4.00.

**No. 10 Hole (No. 101.) Plates** are included in these assortments. They must be ordered separately. The rivets in No. 5 Handy Assortment will fit the No. 101 plates.

We recommend the No. 5 Assortment for general use.

## BELT FASTENERS.

"Potters or Novelty."

Single Leather.		per 100
No. 1.	For 1 inch Belts.	\$1.50
" 2.	" 1½ "	2.00
" 3.	" 2 "	2.50
" 4.	" 2½ "	3.00
" 5.	" 3 "	3.50
" 6.	" 3½ "	4.50
" 7.	" 4 "	5.50
Double Leather.		
No. 8.	For 2 inch Belts.	\$5.00
" 9.	" 2½ "	6.50
" 10.	" 3 "	7.50
" 11.	" 3½ "	8.50
" 12.	" 4 "	9.50
Old Single Leather.		
No. 28.	For 3 inch ex. wide	\$6.00
" 29.	" 4 "	8.00
3 Ply Rubber.		
No. 26.	For 2 inch Belts.	\$4.00
" 17.	" 2½ "	5.00
" 20.	" 3 "	7.00
" 21.	" 4 "	8.00



4 Ply Rubber.		per 100
No. 13.	For 2 inch Belts	\$5.00
" 14.	" 2½ "	6.50
" 15.	" 3 "	7.50
" 16.	" 4 "	9.50

4 Ply Old Belts.		per 100
No. 27.	For 2 inch ex. wide	\$8.00
" 18.	" 3 "	10.00
" 19.	" 4 "	12.00
6 and 6 Ply Rubber.		
No. 22.	For 3 inch Belts.	\$10.00
" 23.	" 4 "	12.00
6, 7 and 8 Ply Old Belts.		
No. 24.	For 3 inch Belts.	\$12.00
" 25.	" 4 "	15.00

Single Leather.		per 100
No. 1.	For 1 inch Belts.	\$1.50
" 2.	" 1½ and 1½ in. Belts.	2.00
" 3.	" 2 "	2.50
" 4.	" 2½ "	3.00
" 5.	" 3 "	3.50
" 6.	" 3½ "	4.50
" 7.	" 4 "	5.50
Extra wide for Old Single Leather Belts and for Belts wider than 4 inches.		
No. 3½.	For 2 inch Belts	\$3.50
" 4½.	" 2½ "	4.50
" 5½.	" 3 "	5.50
" 6½.	" 3½ "	6.50
" 7½.	" 4 "	7.50
Double Leather.		
No. 8.	For 2 inch Belts	\$5.00
" 9.	" 2½ "	6.50
" 10.	" 3 "	7.50
" 11.	" 3½ "	8.50
" 12.	" 4 "	9.50

## STANDARD.

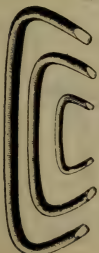


3 Ply Rubber.		per 100
No. 17.	For 2½ inch Belts	\$5.00
" 20.	" 3 "	7.00
" 21.	" 4 "	8.00

4 Ply Rubber.		per 100
No. 12½.	For 1½ inch Belts.	\$4.00
" 13.	" 2 "	5.00
" 14.	" 2½ "	6.50
" 15.	" 3 "	7.50
" 16.	" 4 "	9.50
4 Ply Old Rubber.		
No. 18.	For 3 inch extra wide	\$10.00
" 19.	" 4 "	12.00
6 and 6 Ply Rubber.		
No. 21½.	For 2½ inch Belts.	\$9.00
" 22.	" 3 "	10.00
" 23.	" 4 "	12.00
7 and 8 Ply Rubber.		
No. 24.	For 3 inch extra wide.	\$12.00
" 25.	" 4 "	15.00
" 26.	" 5 ply, extra wide and heavy, for the largest and heaviest belt.	\$25.00
No. 27.	4 in. teeth, ¾ long.	\$33.00

## IMPROVED POINTED BELT HOOKS.

MADE OF BEST NORWAY IRON, WITH SMOOTH OVAL POINTS.



Measurements		Price List.	
End to End.		Packed in Box	Per 1,000
No. 1	2½ inches	100	30.00
" 2	2½ " lighter weight	125	20.00
" 3	2½ " "	125	16.00
" 4	2½ " lighter weight	125	14.00
" 5	2 " "	250	11.00
" 6	1½ " "	250	8.50
" 7	1½ " "	250	6.00
" 8	1½ " "	250	5.00
" 9	1½ " "	500	4.00
" 10	1 " "	500	3.50
" 11	1 " "	500	3.00
" 12	¾ " lighter weight	500	2.80
" 13	¾ " "	500	2.60
" 14	¾ " lighter weight	500	2.40
" 15	¾ " "	500	2.00

## BELT FASTENERS.

TALCOTT'S ACME STEEL BELT HOOKS.



## For Single Leather Belts.

No.	100 in a Box.	Per 100 Hooks
No. 161, for 1/2 and 3/4 inch Belts	.....	\$1 00
No. 162, for 1	.....	1 50
No. 163, for 1 1/4	.....	1 75
No. 164, for 1 1/2	.....	2 00
No. 165, for 1 3/4	.....	2 25
No. 166, for 2	.....	2 50
No. 167, for 2 1/4	.....	2 75
No. 168, for 2 1/2	.....	3 00
No. 169, for 2 3/4	.....	3 50
No. 170, for 3	.....	4 00

## For Extra Heavy Single Leather and 3-Ply Rubber Belts.

No.	100 in a Box.	Per 100 Hooks
No. 192, for 1 1/2 inch Belts	.....	\$2 25
No. 193, for 2	.....	2 75
No. 194, for 2 1/4	.....	3 00
No. 195, for 2 1/2	.....	4 00
No. 196, for 3	.....	4 50
No. 197, for 3 1/4	.....	5 00
No. 198, for 4	.....	6 50
No. 199, for 4 1/4	.....	7 00

## For Double Leather Belts.

No.	100 in a Box.	Per 100 Hooks
No. 202, for 1 1/2 inch Belts	.....	\$3 25
" 203, " 2 " "	.....	3 50
" 204, " 2 1/4 " "	.....	4 00
" 205, " 2 1/2 " "	.....	4 50

No.	50 in a Box.	Per 100 Hooks
No. 206, for 3 inch Belts	.....	5 00
" 207, " 3 1/2 " "	.....	6 50
" 208, " 4 " "	.....	7 00

## Assorted Packages.

No.	100 inches in a Box.	Per 100 inches
No. 183, for Ordinary Single Leather Belting, 100 inches assorted lengths	.....	\$1 50
No. 184, for Extra Heavy and Wide Single Leather and 3 ply Rubber, 100 inches assorted lengths	.....	2 00
No. 185, for Double Leather Belts, 100 inches assorted lengths	.....	2 50
No. 186, for 4-ply Rubber and Cotton Belts, 1/2 thick, 100 inches assorted lengths	.....	2 20
No. 187, for 5-ply Rubber and Cotton Belts, 3/8 thick, 100 inches assorted lengths	.....	2 75
No. 188, for 5 and 6-ply Rubber and Cotton Belts, Extra Wide Backs, 100 inches assorted lengths	.....	3 80

## BRISTOL.



Packed 100 inches in Box.

No. 00—100 inches, \$1.00.  
For Split Leather and Extra Light Belts, from 1-16 in. to 1/4 in. thick.No. 0—100 inches, \$1.00.  
For Split Leather and Light Belts, from 1/4 in. to 3-16 in. thick.No. 1—100 inches, \$1.50.  
For Ordinary Single Leather Belts, from 3-16 in. to 1/2 in. thick.No. 2—100 inches, \$2.00.  
For Extra Heavy and Wide Single Leather Belts, from 1/2 in. to 9-16 in. thick.No. 3—100 inches, \$2.50.  
For Double Leather Belts, from 3-16 in. to 1/2 in. thick.No. 4—100 inches, \$3.00.  
For Heavy Double Leather Belts, from 1/2 in. to 7-16 in. thick.No. 5—100 inches, \$3.50.  
For Extra Heavy Double Leather Belts, from 7-16 in. to 9-16 in. thick.No. 10—100 inches, \$1.10.  
For 2-ply Rubber and Cotton Belts, from 1/4 in. to 3-16 in. thick.No. 11—100 inches, \$1.65.  
For 3-ply Rubber and Cotton Belts, from 3-16 in. to 1/2 in. thick.No. 12—100 inches, \$2.20.  
For 4-ply Rubber and Cotton Belts, from 1/2 in. to 5-16 in. thick.No. 13—100 inches, \$2.75.  
For 5-ply Rubber and Cotton Belts, from 5-16 in. to 3/4 in. thick.No. 14—100 inches, \$3.30.  
For 6-ply Rubber and Cotton Belts, from 3/4 in. to 7-16 in. thick.No. 15—100 inches, \$3.85.  
For 7-ply Rubber and Cotton Belts, from 7-16 in. to 9-16 in. thick.

## Price List Per Thousand.

No. 14.....	\$2 40	No. 6.....	\$8 50
No. 13.....	2 60	No. 5.....	11 00
No. 12.....	2 80	No. 4.....	14 00
No. 11.....	3 00	No. 3.....	16 00
No. 10.....	3 50	No. 2.....	20 00
No. 9.....	4 00	No. 1.....	30 00
No. 8.....	5 00	2 1/2 in.....	60 00
No. 7.....	6 00	3 in.....	60 00

## BLAKE'S BELT STUDS.

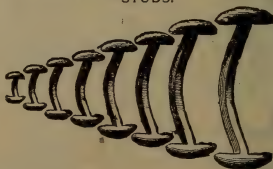
CUTTERS. FOR RUBBER AND LEATHER BELTS.



Facsimile of Trade Mark and Picture on each Box of Blake's Improved Belt Studs.

Small Cutters.....90 Large Cutters.. 1.25  
Awls and Pliers combined.....Each .40

## STUDS.

Number..... 6 5 4 3 2 1 0 00  
Per Box..... .60 .70 .80 .90 1.25 1.65 2.00 2.50

Studs packed in boxes of 100 each; directions on the box. No. 00, the largest, are for very thick double leather, or for five and six ply rubber belts. No. 6, the smallest, are for sewing machines, watchmakers, and small machinery, where the belts are required to run very smooth.



## RIVETS.



## COPPER RIVETS AND BURRS.

7	.49
8	.50
9	.52
10	.54
11	.56
12	.58
13	.60
14	.65
15	.70

Packed in 1 lb. paper boxes.

For assorted sizes, Nos. 8, 9, and 10,  
add 1c. per lb.

Cast Steel Extra.

## RIVET SET AND HEADER.

Number .....	00 and 0	1 and 2	3 and 4	5 and 6	7 and 8				
For Copper Rivets No.	5	6	7	8	9	10-11	12	13	14
Price per Dozen .....	9.00	7.50	6.00	4.50	3.75				
	Half dozen in a box.								

## NORWAY IRON RIVETS.



List of May 10, 1899.

## CENTS PER POUND.

SIZE OF WIRE--Nos. and In.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Len., 1/2 in. & longer, per lb., 15	15	15	15	15	15	16	16	16	17	17	18	19	20	21
1/2	16	16	16	16	16	17	17	17	18	18	19	20	21	22
3/4	16	16	16	16	16	17	17	17	18	18	19	20	21	22
1	16	16	16	16	16	17	17	17	18	18	19	20	21	22
1 1/4	16	16	16	16	16	17	17	17	18	18	19	20	21	22
1 1/2	16	16	16	16	16	17	17	17	18	18	19	20	21	22
1 3/4	16	16	16	16	16	17	17	17	18	18	19	20	21	22
2	16	16	16	16	16	17	17	17	18	18	19	20	21	22
2 1/4	16	16	16	16	16	17	17	17	18	18	19	20	21	22
2 1/2	16	16	16	16	16	17	17	17	18	18	19	20	21	22
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13 1/2	16	16	16	16	16	17	17	17	18	18	19	20	21	22
13 3/4	16	16	16	16	16	17	17	17	18	18	19	20	21	22
14	16	16	16	16	16	17	17	17	18	18	19	20	21	22

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# BELT DRESSING

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# DIAMOND



**BELT DRESSING WARRANTED.**

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**Diamond Belt Dressing** keeps your belting soft and pliable; preserves the leather and makes it as nearly water proof as it can be made. Not only adding new life to the belt, but makes it adhere, and consequently gives more power. It contains no acids, rosin or petroleum products, or in fact any compounds that will injure leather.

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### DIRECTIONS FOR USING.

Clean the belt of all dirt and grease, also the pulleys, then apply the dressing with a sponge, cloth or brush, as often as needed to moisten the grain. It is best to apply after shutting down, which will give the dressing time to go into the belt.

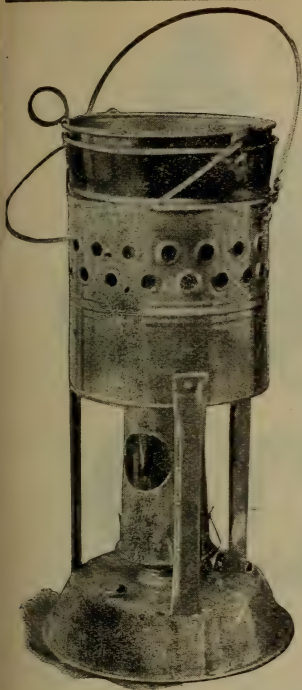
**PUT UP IN ONE-HALF AND ONE GALLON CANS.**

**PRICE PER GALLON,        =        =        =        \$1.50**

---



An invaluable remedy for belt-slipping. A few Sticks scattered in various parts of the Works insures increased Belt Power and more speed to the entire plant. Price (pound sticks) 40c. per lb.



## IMPROVED KEROSENE GLUE POT WITH TIN CHIMNEY.

**A Superior Oil Heater for Heating Glue  
Quick.**

Made of I. X. Tin, upper two pans made of heavy copper, making the pot very durable. **Heats Quicker** than any other glue pot made.

**IT DOES NOT SMOKE OR  
EMIT ANY UNPLEASANT ODORS.**

It is made of the following sizes: One Pint, one and one-half pint, two pints, three pints. Larger sizes made to order.

PRICE EACH.

One Pint .....	\$1 00
One and one-half Pint .....	1 25
Two Pint.....	1 50
Three Pint.....	1 75

### OUR BELT CEMENT.

QUICK SETTING.

One, Three and Five pound Cans... ..\$1 00 per pound.

## Hydraulic Leather Packings

Made in all sizes, from 1 to 36-in. in diam.

The Users of Our Packings FIND THEM RIGHT



GASKETS OR RING PACKINGS

Cut to order any size



HYDRAULIC OR DISC PACKINGS

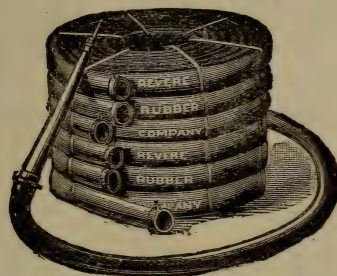
Cut to any size

Special Cup Leather, all thicknesses. Special Hard Rolled Leather for water packings. Heavy Leather for polishing. All special leathers are cut to order and orders promptly executed.



# WATER HOSE.

Regular Brands.



## PRICE LIST. (All Brands.)

Int. Diam.	Conducting Hose. 2-Ply. Per Ft.	Hydrant Hose. 3 Ply. Per Ft.	Engine Hose. 4-Ply. Per Ft.	Engine Hose. 5-Ply. Per Ft.
$\frac{1}{2}$ in.	\$0 20	\$0 25	\$0 30	\$0 37
$\frac{3}{4}$ "	25	30	37	46
1 "	33	40	50	62
$1\frac{1}{4}$ "	42	50	62	77
$1\frac{1}{2}$ "	50	60	75	93
$1\frac{3}{4}$ "	58	70	87	1 08
2 "	66	80	1 00	1 25
$2\frac{1}{4}$ "	75	90	1 12	1 40
$2\frac{1}{2}$ "	83	1 00	1 25	1 56
$2\frac{3}{4}$ "	92	1 10	1 37	1 71
3 "	99	1 20	1 50	1 87
4 "	1 32	1 60	2 00	2 50
5 "	1 65			
6 "	1 98			
7 "	2 31			
8 "	2 64			
9 "	2 97			
10 "	3 33			

Tank Hose for Railroads.

On all kinds of hose, intermediate sizes will be charged at the list price of the next larger size. Thus  $\frac{7}{8}$  in. will be charged at 1 in. price, etc. Five and 6-ply hose made at an advance of 25 and 50 per cent., respectively, on 4-ply prices.

**STEAM HOSE. Regular Brands.****LIST. PER FOOT.**

Interior Diameter.	3-PLY. For 20 lbs. Steam, or less.	4-PLY. For 35 lbs. Steam, or less.	5-PLY. For 50 lbs. Steam, or less.	6-PLY. For 75 lbs. Steam, or less.
$\frac{1}{2}$ inch.	\$0 43	\$0 51	\$0 63	\$0 76
$\frac{3}{4}$ "	51	67	83	1 00
1 "	67	83	1 03	1 24
$1\frac{1}{4}$ "	85	1 04	1 30	1 56
$1\frac{1}{2}$ "	1 02	1 25	1 56	1 87
$1\frac{3}{4}$ "	1 18	1 45	1 81	2 17
2 "	1 34	1 66	2 07	2 49
$2\frac{1}{4}$ "	1 50	1 87	2 33	2 80
$2\frac{1}{2}$ "	1 66	2 08	2 60	3 12
3 "	2 00	2 80	8 50	4 20

Prices for winding any kind of hose with marlin or with either round or flat wire will be given on application.

**Price List for Winding, S. A. P. HOSE.**

	3-Ply.	4-Ply.	5-Ply.	6-Ply.
$\frac{1}{2}$ in., per foot.	\$0 09	\$0 10	\$0 11	\$0 12
$\frac{3}{4}$ " "	11	12	13	14
1 " "	13	14	15	16
$1\frac{1}{4}$ " "	15	16	17	18
$1\frac{1}{2}$ " "	18	19	20	21
$1\frac{3}{4}$ " "	20	21	22	23
2 " "	23	24	25	26
$2\frac{1}{4}$ " "	25	26	27	28
$2\frac{1}{2}$ " "	27	28	29	30

**Hose** For Brewers', Tanners', Oil, Wine, Hot Wax, Hydraulic, and other special Purposes made to order.

LIST PRICE SAME AS STEAM HOSE.

Our Steam Hose is especially adapted for use  
on Steam Drills.

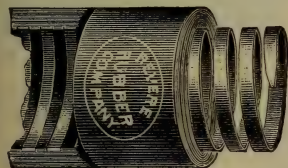


## SUCTION HOSE.

### LIST FOR SPIRAL TINNED IRON WIRE.

Int. Diam.		Per Ft.		Per Ft.
$\frac{3}{4}$ in.	. . . .	\$0 70	. . . .	\$0 77
1 "	. . . .	90	. . . .	1 00
$1\frac{1}{4}$ "	. . . .	1 15	. . . .	1 25
$1\frac{1}{2}$ "	. . . .	1 50	. . . .	1 65
$1\frac{3}{4}$ "	. . . .	1 90	. . . .	2 10
2 "	. . . .	2 30	. . . .	2 50

### LIST FOR SPIRAL BRASS WIRE.



## PLAIN BORE.

FOR EXCAVATING AND  
GENERAL WORK.

### LIST FOR FLAT OR ROUND, GALVANIZED IRON OR STEEL WIRE

Int. Diam.	Per Ft.	Int. Diam.	Per Ft.
$2\frac{1}{2}$ in.	\$3 10	6 in.	\$ 9 50
3 "	4 00	7 "	12 00
$3\frac{1}{2}$ "	4 90	8 "	15 00
4 "	5 80	9 "	17 50
$4\frac{1}{2}$ "	6 70	10 "	20 00
5 "	7 60	12 "	25 00
$5\frac{1}{2}$ "	8 50		

## SUCTION HOSE.

Smooth Bore. For Steam Fire Engines.

### LIST. INTERNAL DIAMETER.

Per Ft.	Per Ft.	Per Ft.
$2\frac{1}{2}$ in. \$3 50	4 in. \$6 50	$5\frac{1}{2}$ in. \$ 9 50
3 " 4 50	$4\frac{1}{2}$ " 7 50	6 " 10 50
$3\frac{1}{2}$ " 5 50	5 " 8 50	

## SUCTION HOSE.

(Continued).

For Mining, Marine Pumps and Dredging.

### LIST. INTERNAL DIAMETER.

	Per Ft.		Per Ft.		Per Ft.
7 in. . . .	\$13 50	12 in. . . .	\$27 50	16 in. . . .	\$37 50
8 " . . . .	16 50	14 " . . . .	32 50	17 " . . . .	40 00
9 " . . . .	19 50	15 " . . . .	35 00	18 " . . . .	42 50
10 " . . . .	22 50				

## HARD RUBBER.

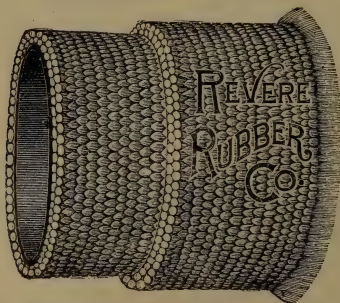
### LIST. [Four-Ply.] INTERNAL DIAMETER.

	Per Ft.		Per Ft.
$\frac{3}{4}$ in. . . . .	\$0 65	$1\frac{1}{4}$ in. . . . .	\$0 93
1 " . . . . .	75	$1\frac{1}{2}$ " . . . . .	1 13

This hose is less expensive than the regular hose made on wire, but will serve as well for many purposes.

## COTTON RUBBER LINED FIRE HOSE.

"JACKET."—Woven.



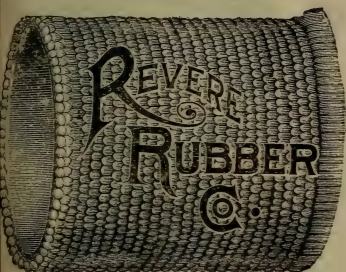
### LIST.

$2\frac{1}{2}$ in. . . . .	\$1 00 per ft.		3 in. . . . .	\$1 40 per ft.
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## COTTON RUBBER LINED MILL HOSE.

WOVEN.



KNIT.

LIST.

				Per Ft.
1	in.	.	.	\$0 40
1½	"	.	.	50
2	"	.	.	60
2½	"	.	.	70

We manufacture these grades of hose especially for fire protection in public buildings, factories, etc.



## LINEN FIRE HOSE.

LIST.

Size.	Unlined, Per Ft.	Lined, Per Ft.
1 in.	\$0 20	
1¼ "	22	\$0 50
1½ "	25	55
2 "	30	65
2¼ "	33	70
2½ "	35	75
3 "	50	1 00

## INTERWOVEN METALLIC FLEXIBLE TUBING

THE NEW ARMOR FOR RUBBER HOSE.



By the use of this Armor a three or four ply hose is made capable of withstanding the highest Steam, Hydraulic or compressed air pressure used. It has the lightness of Aluminium, the durability of Steel and the flexibility of India Rubber and can be made to withstand 3,000 lbs. pressure to the square inch.

It is now universally used in connection with Steam, Air, Gas and Hydraulic Hose.

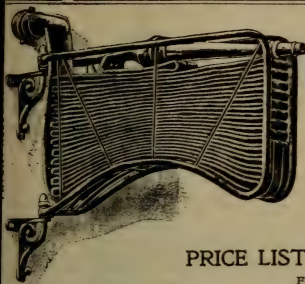
### Hose armored with Metallic Flexible Tubing or the Tubing without Hose.

#### PRICE LIST.

No.	0	will fit hose when outside Diameter is not more than	$\frac{3}{4}$ inch.	Price	8c.	per foot
1	.	.	$\frac{3}{8}$	10c.	"	"
2	.	.	1	12c.	"	"
3	.	.	$1\frac{1}{4}$	14c.	"	"
4	.	.	$1\frac{1}{2}$	16c.	"	"
5	.	.	$1\frac{3}{4}$	18c.	"	"
6	.	.	2	20c.	"	"
7	.	.	$2\frac{1}{4}$	22c.	"	"
8	.	.	$2\frac{1}{2}$	24c.	"	"
9	.	.	$2\frac{3}{4}$	26c.	"	"
10	.	.	3	28c.	"	"

Prices for larger diameters and discount will be furnished on application.

# HUMP SWINGING HOSE RACKS



Japanned red unless otherwise specified.  
Bronzed gold or Aluminum without extra  
cost if so ordered. Pipe clamps cost  
extra : : : : : : : : :

Nos. 5 and 6 will carry heavy hose of almost any make  
in 50-foot lengths. Any size plated in nickel or copper,  
at an additional cost of \$3.00 each, net : : :

## PRICE LIST "RACKS"—With Wall Plates

### FOR UNLINED LINEN HOSE

No.	Size of Hose	Full Capacity		No.	Size of Hose	Full Capacity	
No. 40	For 1½ or 2 inch	50 feet	\$5 00	No. 42	For 2½ inch	100 feet	\$6 00
No. 400	For 2½ inch	50 feet	5 00	No. 43	For 1½ or 2 inch	150 feet	7 00
No. 41	For 1½ or 2 inch	100 feet	6 00	No. 44	For 2½ inch	150 feet	7 00

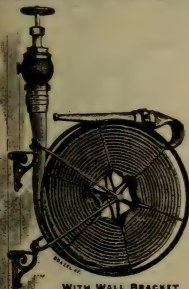
### FOR RUBBER-LINED OR LINEN "MILL" HOSE

No.	Size of Hose	Full Capacity		No.	Size of Hose	Full Capacity	
No. 43	For 1½ or 2 inch	50 feet	\$7 00	No. 45	For 1½ or 2 inch	100 feet	\$7 50
No. 44	For 2½ inch	50 feet	7 00	No. 46	For 2½ inch	100 feet	8 00

NOTICE.—To avoid mistakes and to get the proper "Rack" when you order, give size, kind, and length of hose. When you order "Racks" with "Pipe Clamps," be sure you give size of pipe they are to fit. If not standard size pipe, you must give the outside diameter.

Always use letter "a" with the number of the Rack.

## WIRT'S WALL REEL



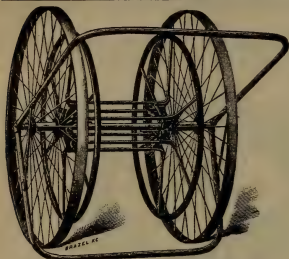
WITH WALL BRACKET

Special sizes made to order. \* Furnished with wall brackets  
unless otherwise specified. \* Pipe clamps extra. \* Finished  
in vermilion unless otherwise specified. \* Finished in gold  
or silver bronze without extra cost. \* We can supply any of the  
sizes in nickel or copper, finished to order at an additional  
cost of \$3.00 each, net : : : : : : : : :

This reel is strong, serviceable, and ornamental. Takes up less  
space and presents less surface for the accumulation of dust than  
any other made. Will swing to any angle from the wall, so that  
a person can draw the hose in any direction by taking hold  
of the nozzle : : : : : : : : :

Number of Reel	0	00	000	2	3	4	5	6	7	8
Size of Hose	1½-1½	2	2½	1½-1½	2	2½	1½-1½	2	2½	2½
Capacity Unlined Linen Hose	50	50	50	100	100	100	200	200	200	
Capacity Rubber-Lined Mill Hose				50	50	50	100	100	100	150
Price	\$6 00	6 00	6 00	6 00	6 00	6 50	7 50	8 00	8 50	11 50

# PARK AND WAREHOUSE REEL



Made of heavy Tubular Iron Mounted  
on Steel Wheels \* For Lawn, Green-  
house or Park Use : : : : :

No.	Height of Wheel	Weight	Capacity $\frac{3}{4}$ -in. Hose	Price Each
21	28 in.	40 lbs.	200 ft.	\$7 50
31	34 in.	50 lbs.	500 ft.	10 50

## WAREHOUSE REEL

For Mills, Factories and Village  
Fire Departments \* \* \*

No.	Height of Wheel	Outside Width of Reel	Weight	Capacity $2\frac{1}{2}$ Rub. Fire Hose	Price Each
41	42 in.	37 $\frac{1}{2}$ in.	130 lbs.	150 ft.	\$35 00
51	48 in.	40 in.	180 lbs.	300 ft.	45 00
61	52 in.	46 in.	200 lbs.	500 ft.	55 00

WRITE FOR DISCOUNTS

# TUBULAR All Iron HOSE REEL

Frictionless \* For Lawn or Garden  
Nos. 40 and 50 for Mill and Factory  
Use : : : : :

No.	Height of Reel	Weight	Capacity $\frac{3}{4}$ - in. Hose	Capacity $2\frac{1}{2}$ -in. Rub. Hose	Price
10	21 in.	17 lbs.	100 ft.	.....	\$3 50
20	24 in.	20 lbs.	150 ft.	.....	4 00
30	30 in.	30 lbs.	500 ft.	.....	6 50
40	35 in.	75 lbs.	.....	100 ft.	25 00
50	40 in.	100 lbs.	.....	200 ft.	32 50



## K. C. No. 1

ALL METAL

The most complete Garden Reel made. Tubular  
frame, steel wire "holds," corrugated iron drum;  
wheels, 7 inches in diameter. Hose cannot mildew  
on this reel owing to corrugated drum. Handsomely  
finished in vermilion and green. Four reels form  
natural crate : : : : :

Weight, 12  $\frac{1}{2}$  Pounds

PRICE, \$2.00



## HOSE REELS.

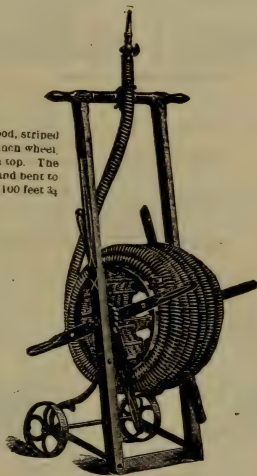
**"THE ECLIPSE."**

**O**R "Bow Top Reel," is made of hardwood, striped and oil finish, has folding reel part, 4-arm wheel, and is furnished with nose holder on top. The frame part is made in one piece, steamed and bent to shape, is very light and strong reel. Holds 100 feet  $\frac{3}{4}$  inch hose.

**"THE SYLPH"**

Capacity 100 Feet  $\frac{3}{4}$  Inch Rubber Hose.

Price . . . . . Each 2.50

**"THE COLUMBIA."**

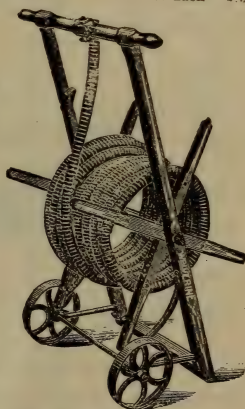
Capacity, 100 Feet  $\frac{3}{4}$  Inch Rubber Hose.

Price . . . . . Each 2.00

**"THE DUDE REEL"**

Capacity, 50 Feet  $\frac{3}{4}$  Inch Rubber Hose.

Price . . . . . Each 1.50

**"THE WOLVERINE"**

**T**HIS Reel is, in appearance, like the "Columbia," but has eight inch wheels, and the 4-arm reel part is made wider and will hold 250 feet of  $\frac{3}{4}$  inch hose. It is finished in oil and striped. This, also is made entirely of hardwood and is a very strong and neat reel. It is intended for a medium priced reel, coming between the "Columbia" and the "Dude."



## SURE GRIP HOSE CLAMPS.

U. S. Patents, Nos. 477,237, 480,513, 480,514, 480,515, 513,322 and Canadian Patent No. 44,081.

MADE OF WROUGHT STEEL,

Which is guaranteed to be STRONGER, LIGHTER and MORE PLIABLE than a cast Clamp.

This device is more perfect in every requirement of a Hose Clamp, than any now in the market, and at a price below all. The construction offers a TRUE INNER CIRCLE before and after tightening. No other clamp has this feature, which entirely obviates the wedge action of the finger and consequent leak.

### Clamps for Hydrant Hose.

SIZE HOSE	PLY	PER DOZ.	SIZE HOSE	PLY	PER DOZ.	SIZE HOSE	PLY	PER DOZ.
$\frac{3}{8}$ Inch	$\left\{ \begin{array}{l} 2 \\ 3 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.00 \\ 1.00 \end{array} \right.$	$1\frac{1}{4}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$2.50 \\ 2.50 \\ 2.50 \end{array} \right.$	$2\frac{1}{4}$ Inch	$\left\{ \begin{array}{l} 1 \\ 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$5.50 \\ 5.50 \\ 5.50 \\ 5.50 \end{array} \right.$
Packed 12 dozen in a box.			Packed 3 dozen in a box.			Packed 2 dozen in a box.		
$\frac{1}{2}$ Inch	$\left\{ \begin{array}{l} 2 \\ 3 \\ 4 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.00 \\ 1.00 \\ 1.00 \end{array} \right.$	$1\frac{1}{2}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$3.00 \\ 3.00 \\ 3.00 \end{array} \right.$	$2\frac{1}{2}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$7.00 \\ 7.00 \\ 7.00 \end{array} \right.$
Packed 6 dozen in a box.			Packed 3 dozen in a box.			Packed 2 dozen in a box.		
$\frac{3}{4}$ Inch	$\left\{ \begin{array}{l} 2 \\ 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.00 \\ 1.00 \\ 1.00 \\ 1.00 \end{array} \right.$	2 Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$4.00 \\ 4.00 \\ 4.00 \end{array} \right.$	$2\frac{3}{4}$ Inch	4	\$8.50
Packed 6 dozen in a box.			Packed 2 dozen in a box.			Packed 1 dozen in a box.		
1 Inch	$\left\{ \begin{array}{l} 2 \\ 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.50 \\ 1.50 \\ 1.50 \\ 1.50 \end{array} \right.$				3 Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \end{array} \right.$	$\left\{ \begin{array}{l} \$10.00 \\ 10.00 \\ 10.00 \end{array} \right.$
Packed 3 dozen in a box.						Packed 1 dozen in a box.		

### Clamps for Steam Hose.

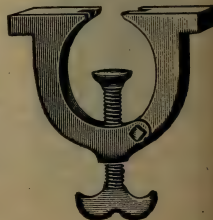
SIZE HOSE	PLY	PER DOZ.	SIZE HOSE	PLY	PER DOZ.
$\frac{1}{2}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.00 \\ 1.00 \\ 1.00 \\ 1.00 \end{array} \right.$	$1\frac{1}{4}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$3.00 \\ 3.00 \\ 3.00 \\ 3.00 \end{array} \right.$
Packed 6 dozen in a box.			Packed 3 dozen in a box.		
$\frac{3}{4}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$1.50 \\ 1.50 \\ 1.50 \\ 2.00 \end{array} \right.$	$1\frac{1}{2}$ Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$3.50 \\ 3.50 \\ 3.50 \\ 3.50 \end{array} \right.$
Packed 3 dozen in a box.			Packed 3 dozen in a box.		
1 Inch	$\left\{ \begin{array}{l} 3 \\ 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$2.50 \\ 2.50 \\ 2.50 \\ 2.50 \end{array} \right.$	2 Inch	$\left\{ \begin{array}{l} 4 \\ 5 \\ 6 \end{array} \right.$	$\left\{ \begin{array}{l} \$5.50 \\ 5.50 \\ 5.50 \end{array} \right.$
Packed 3 dozen in a box.			Packed 2 dozen in a box.		

### Adjustable Vise Jaws.

- No. 1. Suitable for all size Clamps, from  $\frac{1}{2}$ " 2-ply Hydrant to 1" 5-ply Hydrant, net price each.....\$ .70
- No. 2. Suitable for all size Clamps, from  $\frac{3}{4}$ " 6-ply Steam to  $1\frac{1}{2}$ " 5-ply Steam, net price each.....\$ .80
- No. 3. Suitable for all size Clamps, from  $1\frac{1}{2}$ " 6-ply Steam to 3" 5-ply Hydrant, net price each.....\$1.00

### Clamps for Cotton Mill Hose.

- $1\frac{1}{4}$  Inch, per doz., \$2.00  
Packed 3 dozen in a box.
- $1\frac{1}{2}$  Inch, per doz., 2.50  
Packed 3 dozen in a box.
- 2 Inch, per doz., 3.50  
Packed 2 dozen in a box.



ADJUSTABLE VISE JAWS

## GEM HOSE NOZZLES.



Per dozen	Inch	$\frac{3}{4}$	1
		10.00	15.00

## MAGIC HOSE NOZZLES.



Per dozen	Inch	$\frac{3}{4}$	1
		12.00	15.00

## HOSE SPRINKLERS.



Diameter, inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Per dozen	3.50	4.50	6.00	9.00	12.00	18.00

## HOSE COUPLINGS.

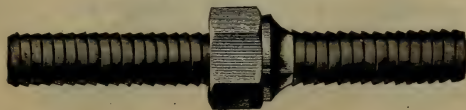
## HOSE SPLICES.



	Inch	$\frac{1}{8}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
With Hose Thread, per dozen		2.40	2.40	4.40	10.00	14.00	24.00	48.00	75.00		
With Iron Pipe Thread, per doz.		2.65	2.65	4.65	10.50	15.00	26.00	50.00	76.00	120.00	150.00
Brass, per dozen		1.20	1.20	2.00							
Iron, Coppered, per dozen		.40	.50	1.00							

For either part of Hose Coupling, two thirds of price of complete Coupling.

## STEAM HOSE COUPLINGS.



Each	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
		1.25	1.25	1.50	2.00	2.50	3.50	6.00

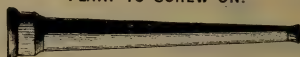
## HOSE NOZZLES.

## PLAIN-TO TIE ON.



	Inch	$\frac{1}{2}$	$\frac{3}{4}$	1
Length, inches .....		$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$
Per dozen .....		3.00	3.50	4.00

## PLAIN-TO SCREW ON.



	Inch	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Length, inches .....		8	8	12	12	12	15
Per dozen .....		7.00	9.00	18.00	22.00	34.00	65.00

## WITH SCREW TIP.



	Inch	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Length, inches .....		8	12	8	12	12	15	12	15	12	20	15	24
Per dozen .....		8.00	10.00	10.00	12.00	20.00	24.00	25.00	30.00	38.00	50.00	75.00	100.00

## WITH COCK ON LARGE END



	Inch	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Length, inches .....		8	12	8	12	12	15	20	20	12	20	24	24
Per dozen .....		13.00	18.00	15.00	20.00	40.00	45.00	55.00	80.00	80.00	110.00	200.00	200.00

## FULLER HOSE NOZZLE.



	Inch	$\frac{3}{4}$	1
Per dozen .....		18.00	30.00



# BLACK HAWK

[Trade Mark]

## SHEET PACKING.

BLACK HAWK PACKING is specially adapted for very high pressure, and it is not affected by any degree of steam heat. It will not harden under any degree of heat, nor blow out under the highest pressure and will make an air, steam, or hot or cold water joint equally well. This packing is not affected by ammonia, liquors, steam heat or alkalies, and conforms to rough or uneven surfaces, making a perfectly tight joint, and retains its elasticity under all conditions. Joints can be made and broken several times.

This packing will not adhere to rough surfaces.

Joints in new plants can be made without the use of steam with absolute certainty when steam is applied that every joint will be perfect.

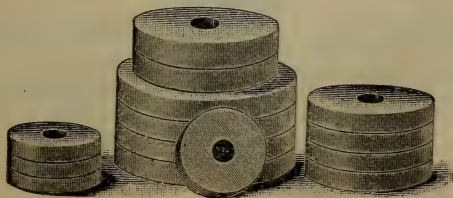
Made in rolls 1-16, 1-8 inch, 200 lbs. each. All other sizes 100 lb. each.



List Price: Sheet, 80c. per lb.; Gaskets, Rings, etc., \$1.25 per lb.

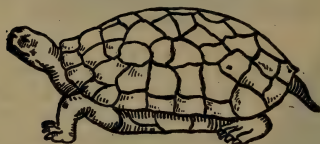
# VALVES

FOR ALL KINDS OF PUMPS.



# "USUDURIAN"

TRADE MARK



ON EVERY YARD

Is an unvulcanized, self-vulcanizing rubber packing, made from the best possible materials.

It packs any kind of steam, hot air or hot water joints; it is a non-conductor and lasts longer than any other packing in use.

It is particularly adapted to packing steam chest covers and all super-heated steam joints, as it will not burn or char.

The genuine "Usudurian" is the most durable, effective and economical packing made, and is adapted to all the uses that packing is put to.

This packing, applied in an unvulcanized state, readily accommodates itself to any unevenness in the surfaces it is placed between.

When steam comes in contact with "Usudurian" it becomes vulcanized and of a metallic nature.

In many cases joints are uneven and require building up on one side. By using this packing, any kind of a graduated joint can be made with comparatively no trouble or expense.

By the application of a little naphtha to the surfaces, two pieces of "Usudurian" can be put together and under pressure become as solid as one piece.

"Usudurian" will make a tight joint, however rough the surfaces may be to which it is applied.

To locomotive engine builders and railroad companies "Usudurian" is invaluable, as it obviates the necessity of facing joints, therefore reducing the cost of construction and repairs, as joints will remain tight much longer, "Usudurian" not being affected by contraction or expansion.

List price, \$ .80 per pound.

## RAINBOW PACKING.

**Makes Steam, Flange and Hot Water Joints Instantly**

Thousands of  
Imitators  
No Equal.  
Will Hold  
Highest  
Pressure.



Don't have  
to use wire  
and cloth  
to hold  
Rainbow.  
Can't blow it out.

The Color of Rainbow Packing is Red.

Notice our Trade Mark of Three Rows of Diamonds extending throughout the entire length of each and every roll of Rainbow Packing.

**Will Carry in Stock for Years**

It is an undisputed fact that "Rainbow" Packing is the only sheet or flange packing in the world that will carry in stock for months and years without hardening or cracking.

## THE PEERLESS PISTON AND VALVE ROD PACKING.



**Once Tried**

**Always Used**

$\frac{1}{4}$  to 2 inch diameter

**Will Hold**

**400 lbs. Steam**

In boxes, 3 to 8 pounds

## JENKINS "96" SHEET PACKING.

# JENKINS "96" SHEET PACKING



### THE PERFECTION OF JOINT PACKINGS.

Excels all other packings not only from the fact that with it a perfect joint can be made quickly and which will not require to be followed up when steam pressure is turned on, but that it vulcanizes in place and forms what may be termed a metal which will not rot or burn out, but will last as long as the metals which hold it.

Jenkins '96 Packing does not require to be heated to complete the joint and can be used for cold joints as well as hot; it will also pack joints with rough surfaces equally as well as when they are faced. For rough joints thicker packing should be used than when surfaces are faced.

Jenkins '96 Packing can be made any thickness desired. If you have only thin packing on hand, place two or more thicknesses together. It will soon amalgamate and become solid.

Jenkins '96 Packing once used is always preferred as it saves labor, time, and money, and will stand more heat and pressure than any other packing.

Jenkins '96 Packing is made one yard wide and  $\frac{1}{32}$  in.,  $\frac{1}{16}$  in.,  $\frac{3}{32}$  in.,  $\frac{1}{8}$  in.,  $\frac{3}{16}$  in., and  $\frac{1}{4}$  in. thick. The  $\frac{3}{32}$  in. weighs about  $2\frac{1}{4}$  lbs. per square yard,  $\frac{1}{16}$  in.  $5\frac{1}{2}$  lbs.,  $\frac{3}{32}$  in.  $8\frac{1}{4}$  lbs.,  $\frac{1}{8}$  in. 11 lbs.,  $\frac{3}{16}$  in.  $16\frac{1}{2}$  lbs.,  $\frac{1}{4}$  in.  $22\frac{1}{2}$  lbs. Special sizes can be made to order.

Jenkins Standard '96 Packing weighs 33.3 per cent less than most joint packings. Compare the weight of our packing with equal sizes of other packings sold at a lower price per pound, and you will find that it will cost less per square yard.

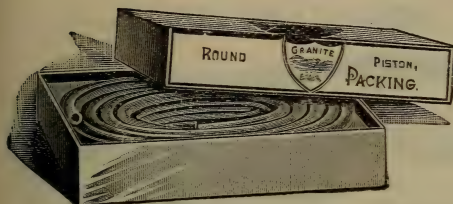
JENKINS '96 PACKING, 80 CENTS PER POUND.

GASKETS MADE FROM JENKINS '96 PACKING, SPECIAL PRICES ON APPLICATION.



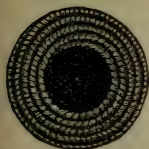
# GRANITE PISTON PACKING.

[Trade Mark]



(COMMONLY  
CALLED  
TUCK'S PACKING.)

ROUND.



For packing the piston rods and valve stems of steam engines and pumps. Made in 12-foot lengths.

List price, \$ .85 per pound.

SQUARE.



## CLOTH INSERTION SHEET PACKING.

PRICE LIST PER POUND.



Thick- ness.	1-Ply.	2-Ply.	3-Ply.	4-Ply.
1-64 in.	\$0 70	. . .	. . .	. . .
1-32 "	65	. . .	. . .	. . .
1-16 "	60	\$0 63	\$0 66	. . .
3-32 "	55	58	61	. . .
1-8 "	. . .	55	58	\$0 61
3-16 "	. . .	. . .	55	58
1-4 "	. . .	. . .	. . .	55

For steam joints and weather strips. Made with cloth insertion, cloth one side or both sides.

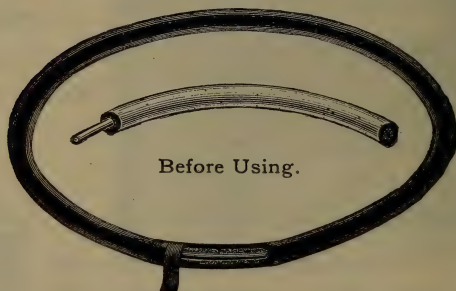
Each cloth, whether insertion or on outside, to count as one ply.

Three cents per pound additional will be charged for each extra ply of cloth.

# BLACK HAWK

[Trade Mark]

## TUBING FOR GASKETS.



The BLACK HAWK Tubing for gaskets is made from the celebrated BLACK HAWK compound, red inside, with a black semi-vulcanized cover, which prevents it from sticking. It is not affected by any degree of steam heat. It will make a tight joint, no matter how rough the surface may be, and it will not blow out.

One of the principal advantages of this Tubing is that it can be cut to any length desired in order to fit any size of manhole, or handhole, plate or pipe flange. The cut ends are joined together with our metal core, thus making a *continuous gasket*.

It is put up in convenient boxes with metal core and tape.

With two or three sizes of tubing on hand, you are ready at any time to make a gasket to fit any joint. The same gasket can be used several time.

### DIRECTIONS FOR USE.

Place the tubing around the plate or flange, about 3-16 of an inch from the inside shoulder. Cut the ends either square or on the bias, as may be convenient. Insert a piece of our metal core, about half its length, in each end of the tubing; draw the ends tightly together, and wind the joint diagonally with our V.Z. frictioned tape.

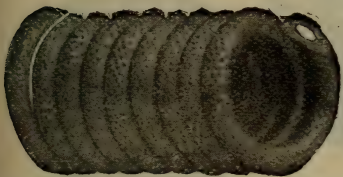
Made in sizes  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$ ,  $\frac{3}{4}$ , and 1 inch.

List Price, \$1.00 per pound.

## SAMSON PISTON ROD PACKING.

[Trade Mark]

This is a round packing made in spiral form, with a red rubber core wrapped in specially prepared duck and a high grade of plumbago. It will hold over 430 pounds of superheated steam, and is conceded by representative electrical engineers to have no equal. It is made from a compound that will not harden from any degree of heat.



SPECIALLY ADAPTED FOR MARINE WORK.

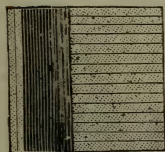
When applying this packing allow for expansion.

Our label is on every box.

List price, \$ .80 per pound.

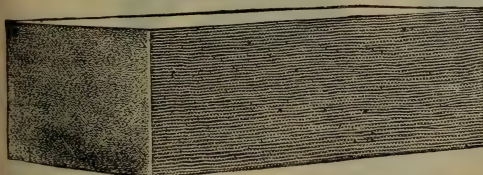
## GRANITE PISTON PACKING WITH RUBBER BACK.

[Trade Mark]



Made in 20-foot lengths.

List price, \$1.00 per pound.



## GIANT

[Trade Mark]

FINE SQUARE  
PUMP PACKING.

We make to order for steam pumps a square packing, using fine duck and white rubber. Made in 12-foot lengths.

List price, \$ .85 per pound.

## REVERE SPIRAL SQUARE PACKING.

[Trade Mark]

LUBRICATED.



This packing is made in continuous coils shaped to fit the rod and box. It is treated with our special lubricant, which makes it very flexible. It is made in 12-foot lengths, and furnished in sizes up to 2 inches. Each box contains one coil. We only furnish full boxes. We carry all the usual sizes in stock.

List price, \$1.20 per pound.

## REVERE RING PACKING.

[Trade Mark]

LUBRICATED.



This Single and Double Ring Lubricated Packing is treated with our special lubricant.

The rings are made to exactly fit the rod and box.

The Double Rings can only be used in the larger sizes. The Single Rings can be used in any size.

Give exact measurements when ordering.

List price, \$1.20 per pound.



# GARLOCK PACKINGS

THE OLD RELIABLE

ELASTIC RING



STYLE No. 5

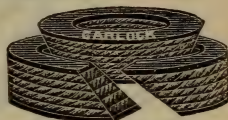
Price.....Per Pound \$1.20

SPIRAL

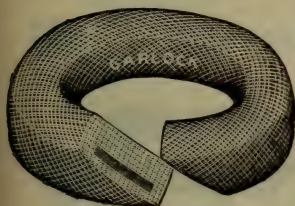


STYLE No. 15

SECTIONAL RING



STYLE No. 10



STYLE No. 200

## HIGH PRESSURE PACKING

This packing is especially adapted to high pressure work, and the construction is without question designed to insure long service.

Price .....Per Pound \$2.00



STYLE No. 99

## THE GARLOCK WATERPROOF HYDRAULIC

is the outcome of numerous experiments and many practical tests on the water ends of pistons, plungers, hydraulic elevators, etc., and with results that fully justify the claim that this is a first-class water packing, made of the best flax, lubricated with a waterproof compound, which is strictly free from acid.

Price .....Per Pound \$1.25

## GARLOCK BROWN SHEET PACKING

You can use it under any conditions *on the Worst Joint you Have*, and if it don't do the work IT WON'T COST YOU A CENT.

Price.....Per Pound .60

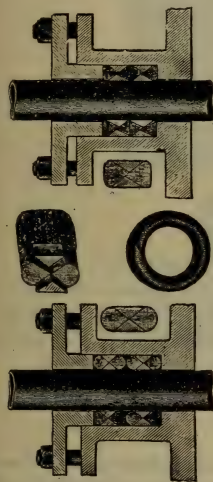
We supply the above Packings, and their many other



Packings manufactured for special purposes.



This Packing is composed of opposite triangular or half round strips, of a hard fibrous or other material which are disposed point to point, or with the fluted surfaces, one against the other, the stuffing box and the piston rod, in the upper and lower spaces thus formed; between these



strips is inserted forcing of a softer material either square, round or wedge shape, which by its expansion, will fill the entire space, and thereby form an elastic cushion for the harder material to automatically follow up any wear that may be on the rod or packing.

Price, per pound, \$1.00

### Extra Heavy Flange Unions.

For a Working Pressure of 250 Pounds.

Size, inches	1	1½	2	2½	3	3½	4	4½	5	6	7	8
Diam. of flanges, inches	3½	3¾	4	4½	5	5½	6	6½	7	7½	8	8½
No. of bolts in each	3	4	4	4	5	5	6	6	7	8	9	10
Price, each	70c	80c	1 00	1 15	1 50	1 90	2 25	2 70	3 15	4 00	4 75	5 60

### Corrugated Copper Gaskets.



— FOR —  
 Unions, Steam, Air, Gas  
 or  
 Flange Unions, Water Pipe  
 and Plain Connections.  
 Flange Joints.

### Gaskets for Unions.

Size of Union	Inside Diam. of Gasket, inches	Outside Diam. of Gasket, inches	Price, each	Price, each
1	1½	2	2c	5c
1½	2	2½	2c	6c
2	2½	3	2c	6c
2½	3	3½	2c	11c
3	3½	4	3c	18c
3½	4	4½	4c	18c

## VULCABESTON.

Vulcabeston is Asbestos in combination with waterproofing and vulcanizing material.

It is furnished in Sheets, in Round Braided Packing, in Pressed Rope Gaskets, and in Moulded Gaskets, and is used for Steam Joint Packing, Valve Stem Packing, Handhole and Manhole Gaskets.

## VULCABESTON SHEET PACKING.

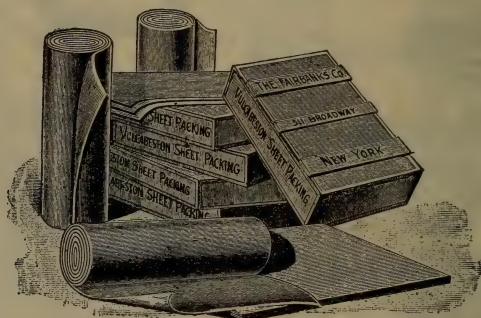


Fig. 290.

Our Improved Vulcabeston Sheet Packing is a superior Steam Joint Packing on account of its permanent resistance to heat. It is not liable to injury by Acids, Gases, etc., will not shrink or absorb moisture, and is invaluable for a number of purposes.

Thickness.	Size of Sheets.	Approximate Weight per Sheet.	Price per Sheet.
1	35 × 35	2 lbs.	2.40
1 1/4	35 × 35	3 1/4 "	3.00
1 1/2	35 × 35	6 "	4.60
1 3/4	35 × 35	8 1/2 "	7.00
2	35 × 35	11 "	8.00

Also furnished in Rolls, 34 1/4 inches wide, to order.



## VULCABESTON BRAIDED ROUND PACKING.



Fig. 291.

This is a flexible Round Packing composed of strong, twisted strands of pure Asbestos, braided, and combined with waterproofing material, vulcanized and coated with plumbago. It is an excellent packing for high pressure steam, hot water, oil, acids, and ammonia, also for locomotive, stationary, and marine engine throttle valves. It is self-lubricating, and will not shrink, pulp, or blow out.

For convenience in handling it is put on spools of following sizes:  $\frac{1}{2}$ , 1, 5, 10 pounds.

Diameter of Packing	Number of Feet in a Pound.	Price per Pound.
$\frac{1}{8}$	450	1.25
$\frac{1}{4}$	128	1.00
$\frac{3}{8}$	50	1.00
$\frac{1}{2}$	25	1.00
$\frac{3}{4}$	16	1.00
$1\frac{1}{8}$	9	1.00
$1\frac{1}{4}$	8	1.00
$1\frac{3}{8}$	$6\frac{1}{8}$	1.00
$1\frac{1}{2}$	4	1.00
$1\frac{3}{4}$	3	1.00
$2$	$2\frac{1}{4}$	1.00
	$1\frac{1}{2}$	1.00
	1	1.00

Also furnished on 25 or 50 pound Reels, to order.

# VULCABESTON ELLIPTICAL PRESSED ROPE GASKETS.

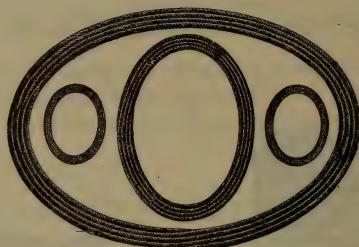


Fig. 407.

Made from Vulcabeston Round Packing for use on Handhole and Manhole Plates, Flanged Steam Joints, etc. We give below list of standard sizes:

Number.	Inside Diameter.	Thickness.	Price per Gasket.	Number.	Inside Diameter.	Thickness.	Price per Gasket.
1	2 × 3	1/8	14	36	4 1/2 × 6 3/4	1/8	.24
2	2 1/4 × 3 1/4	1/8		37	5 × 7	1/8	
3	2 1/2 × 3 3/4	1/8		38	4 3/4 × 7	1/8	
4	2 5/8 × 3 5/4	1/8		39	4 1/4 × 6 3/4	1/8	
5	2 5/8 × 3 7/8	1/8	16	40	4 3/4 × 7 3/4	1/8	30
6	2 7/8 × 3 7/8	1/8		41	4 1/2 × 6	1/8	
7	2 7/8 × 4	1/8		42	5 1/2 × 8	1/8	
8	2 7/8 × 4 7/8	1/8		43	6 1/2 × 8 1/4	1/8	
9	3 × 4	1/8		44	5 3/4 × 9	1/8	
10	3 × 4 1/2	1/8		45	5 5/8 × 8	1/8	
11	3 1/4 × 4 1/4	1/8		46	7 × 9 3/4	1/8	
12	3 1/4 × 4 1/2	1/8		47	5 1/2 × 7 1/2	1/8	
13	3 1/8 × 4 1/2	1/8		48	6 1/2 × 11	1/8	
14	3 1/2 × 4	1/8	18	49	7 1/2 × 12 3/4	1/8	.40
15	3 1/4 × 4 3/4	1/8		50	8 3/4 × 11 3/4	1/8	
16	3 1/8 × 4 3/8	1/8		51	8 1/2 × 12 1/4	1/8	
17	3 3/8 × 4 3/4	1/8		52	9 1/4 × 13 3/8	1/8	
18	3 7/8 × 4 3/4	1/8		53	9 × 13 3/8	1/8	
19	2 7/8 × 5 3/8	1/8		54	9 3/8 × 14 1/8	1/8	
20	3 × 5	1/8		55	9 1/8 × 15	1/8	
21	3 1/2 × 5	1/8		56	10 × 14	1/8	
22	3 1/4 × 5 3/4	1/8		57	10 × 13 3/8	1/8	
23	3 1/4 × 5 1/2	1/8	20	58	10 1/2 × 14 1/2	1/8	.76
24	3 1/2 × 5 1/2	1/8		59	10 1/2 × 14 1/8	1/8	
25	3 3/8 × 5 1/2	1/8		60	10 1/2 × 14 3/8	1/8	
26	3 3/4 × 5 1/2	1/8		61	10 3/8 × 15 3/4	1/8	
27	3 3/4 × 5 3/4	1/8		62	10 7/8 × 14	1/8	
28	4 × 5	1/8		63	11 × 14	1/8	
29	4 × 5 1/2	1/8		64	11 × 15	1/8	
30	4 × 5 3/4	1/8		65	12 × 16	1/8	
31	4 1/2 × 5 3/4	1/8		66	11 3/8 × 15 1/8	1/8	
32	3 3/4 × 6	1/8	.24	67	10 7/8 × 16	1/8	1.00
33	4 × 6	1/8		68	12 × 15	1/8	
34	4 1/2 × 7	1/8		69	10 1/4 × 17 1/2	1/8	
35	5 × 6	1/8					

Elliptical Gaskets not included in the above sizes can be furnished. Prices on application.

## VULCABESTON ROUND PRESSED ROPE GASKETS.



Fig. 408.

Made expressly for Companion Flange Joints of standard sizes. Ready for use; no waste.  
The most satisfactory Joint Packing possible.

Number.	Size Pipe or Valve.	Inside Diameter.	Outside Diameter.	Thickness.	Price per Gasket.
1	2	3	4	$\frac{1}{8}$	.17
2	$2\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$\frac{1}{8}$	.18
3	3	$4\frac{1}{4}$	$5\frac{1}{4}$	$\frac{1}{8}$	.19
4	$3\frac{1}{2}$	$5\frac{1}{4}$	$6\frac{1}{4}$	$\frac{1}{8}$	.21
5	4	$5\frac{5}{8}$	$6\frac{5}{8}$	$\frac{1}{8}$	.22
6	$4\frac{1}{2}$	$5\frac{7}{8}$	$6\frac{7}{8}$	$\frac{1}{8}$	.23
7	5	$6\frac{3}{8}$	$7\frac{3}{8}$	$\frac{1}{8}$	.24
8	6	$7\frac{3}{8}$	$8\frac{3}{8}$	$\frac{1}{8}$	.26
9	7	$8\frac{3}{8}$	$9\frac{3}{8}$	$\frac{1}{8}$	.44
10	8	$9\frac{3}{8}$	$10\frac{3}{8}$	$\frac{1}{8}$	.48
11	9	$10\frac{3}{8}$	$12\frac{3}{8}$	$\frac{1}{8}$	.54
12	10	$11\frac{3}{4}$	$13\frac{1}{4}$	$\frac{1}{8}$	.58
13	12	$14\frac{1}{2}$	16	$\frac{1}{8}$	.72
14	14	$15\frac{5}{8}$	$17\frac{5}{8}$	$\frac{1}{4}$	1.10
15	15	$16\frac{3}{8}$	$18\frac{3}{8}$	$\frac{1}{4}$	1.20
16	16	$17\frac{3}{8}$	$20\frac{1}{8}$	$\frac{1}{4}$	1.40
17	18	19	$21\frac{1}{2}$	$\frac{1}{4}$	1.60
18	20	$21\frac{1}{4}$	$23\frac{3}{4}$	$\frac{1}{4}$	1.80
19	22	$23\frac{3}{8}$	$25\frac{1}{8}$	$\frac{1}{4}$	2.00
20	24	$25\frac{1}{2}$	28	$\frac{1}{4}$	2.40

## VULCABESTON PRESSED ROPE PISTON ROD RINGS.



Fig. 298.

Concave or Convex,  $\frac{3}{4}$  inch inside diameter and larger.....Per Pound 2.00

Less than  $\frac{3}{4}$  Inch Inside Diameter, prices on application.

## VULCABESTON

## MOULDED GASKETS AND WASHERS.



Fig. 292.

## Handhole and Manhole Gaskets.

$\frac{3}{4}$ Ounce and less than 3 Ounces in Weight .....	Each per 'Pound	2.50
3 Ounces and more .....	"	2.00

Round or Square. Less than  $\frac{3}{4}$  ounce, prices on application.

These prices cover Gaskets or Plain Rings after moulds, which are extra, have been furnished.

Odd styles and shapes to order. Prices on application

In ordering, give both inside and outside dimensions and thickness wanted.



Fig. 296.

## Union Washers.

Size of Union.	Inside Diameter.	Outside Diameter.	$\frac{1}{8}$ Inch Thick. Price per Hundred.	$\frac{1}{4}$ Inch Thick. Price per Hundred.
$\frac{1}{4}$	$\frac{17}{16}$	$\frac{11}{8}$	1.50	2.00
$\frac{3}{8}$	$\frac{9}{8}$	1	1.75	2.25
$\frac{1}{2}$	$\frac{5}{4}$	$1\frac{1}{8}$	2.00	2.50
$\frac{3}{4}$	$\frac{11}{8}$	$1\frac{1}{4}$	2.25	2.75
1	$1\frac{1}{8}$	$1\frac{7}{8}$	2.75	3.25
$1\frac{1}{4}$	$1\frac{7}{8}$	$2\frac{1}{8}$	3.25	4.00
$1\frac{1}{2}$	$1\frac{11}{8}$	$2\frac{1}{2}$	3.75	5.00
2	$2\frac{1}{4}$	$2\frac{3}{4}$	4.25	5.50
$2\frac{1}{2}$	$2\frac{11}{8}$	$3\frac{1}{8}$	6.75	8.00
3	$3\frac{1}{4}$	$4\frac{1}{8}$	8.00	10.00



Fig. 297.

## Faucet Washers.

Size of Bibb.	Diameter.	Price per Hundred.
$\frac{3}{8}$	$\frac{5}{8}$	2.00
$\frac{1}{2}$	$\frac{3}{4}$	2.00
$\frac{5}{8}$	$\frac{7}{8}$	2.50
$\frac{3}{4}$	1	2.50



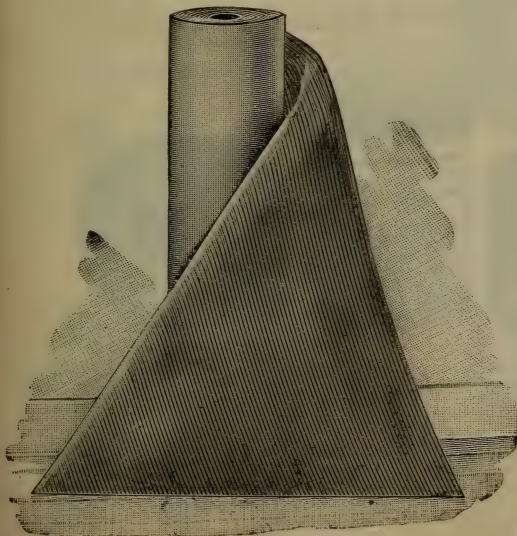
**PERFORATED MATS.** Plain or Corrugated Surfaces.**LIST.**

3-16 in. thick,	. . . . .	}	\$0 75 square ft.
1-4 " "	. . . . .		1 00 "
3-8 " "	. . . . .		1 25 "
1-2 " "	. . . . .		
Black letters in black mats	. . . . .		\$0 25 each extra.
Red or White in black mats	. . . . .		50 " "
Black letters in white mats	. . . . .		50 " "

Scrip and fancy letters or monograms furnished if desired. Mats made to order of any size or special shape. Made in many different designs.

**MATTING. CORRUGATED.**

For Hallways and Corridors, Stair Treads and Steps.

**LIST.**

3-32 in.	\$0 33 per sq. ft.
1-8 "	40 " " "
3-16 "	56 " " "
1-4 "	73 " " "
3-8 "	1 03 " " "
1-2 "	1 30 " " "

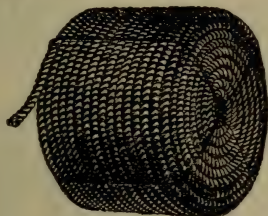
Made either 36 or 42 inches wide; any length desired. Cut to order in any size or shape. Brass nozings furnished, ready for putting down.



**Manila Rope.**

For the Transmission of Power and Manila Rope  
for Hoisting purposes.

We are prepared to furnish from stock all sizes of  
transmission rope from  $\frac{3}{8}$ " to 2" in diameter,  
and all sizes of hoisting rope from  $\frac{3}{8}$ " to 2" in  
diameter, in any length up to 1,200', and can  
furnish to order 3,000' to 5,000' in one piece  
without a splice.

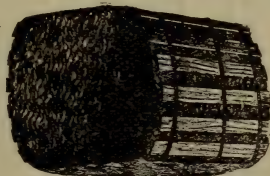
**WEIGHT AND STRENGTH OF MANILA  
CORDAGE.**

The weights given in table are as nearly correct  
as possible.

Size, Diameter inches	Weight of 100 Fathoms Manila in lbs.	Strain Borne by New Rope, lbs.	Feet in a pound
3-16	12	540	50'
1-4	18	780	33 4'
5-16	24	1 000	25
3-8	30	1 250	20
7-16	37	1 562	17 8
1-2	46	2 250	13
9-16	65	3 062	9 3
5-8	80	4 000	7 6
3-4	98	5 000	6
13 16	120	6 250	5
7-8	142	7 500	4 3
1	170	9 000	3 6
1 1-16	200	10 500	3
1 1 8	230	12 250	2 7
1 1 4	271	14 000	2 3
1 5-16	316	16 000	1 11
1 3-8	346	18 062	1 8
1 1-2	390	20 250	1 6
1 9-16	435	22 500	1 5
1 5-8	480	25 000	1 3
1 3-4	581	30 250	1
2	678	36 000	10 1/2
2 1-4	798	42 250	9
2 1-2	930	49 000	7 1/2
2 3-8	1 106	56 250	6 1/2
2 5-8	1 265	64 000	5 1/2
2 7-8	1 420	72 250	5
3	1 572	81 000	4 1/2
3 1-8	1 760	90 250	4
3 3-8	1 950	100 000	3 1/2

**Lath yarn.**

"B" 110 Yarns in the strand.  
"C" 130  
"D" 200

**OAKUM.**

Best Oakum in 50 lb. Bales.  
U. S. Navy Oakum in 50 lb. Bales.  
Navy Oakum in 50 lb. Bales.

**PLUMBERS' SPUN OAKUM.**

Span Oakum for plumbers' use.

**COTTON WASTE.**

Per lb.

Extra Machine Cotton \$0.08  
Diamond X White 7 1/2  
No 3 White 7  
Fancy Colored 4  
No. 1 Colored 5 1/2  
No. 2 Colored 5

## WIRE ROPE.

Transmission or Haulage Rope.



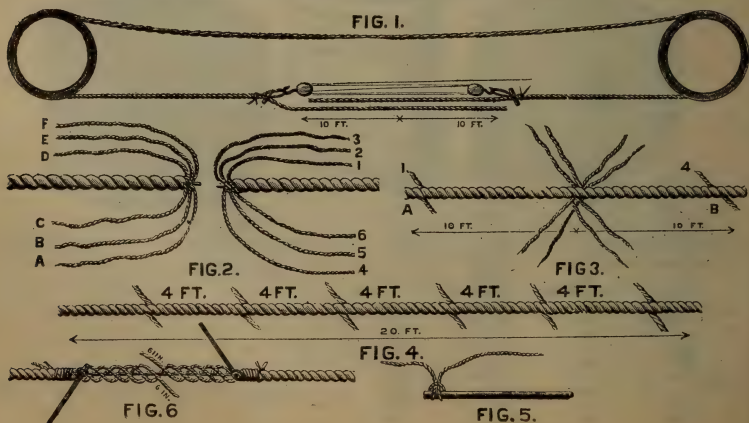
THE Wire Rope mentioned on this page is composed of six strands of seven wires each, laid around a hemp heart. This rope is much stiffer than the Standard Hoisting Rope, and is more suitable for standing rope guys and rigging. When used as hoisting rope or running rope, proportionately larger drums and sheaves are necessary. From  $\frac{3}{4}$  inch diameter down to the smaller sizes, the ropes give excellent service for transmitting power and for underground haulage in coal mines. The wires being fewer in number in the strand, they are correspondingly coarser, and are consequently better adapted to resist the rough work of a mine than the fine wire of the more pliable rope. The coarse rope is made of steel as well as iron. When made of steel, it becomes all the more necessary to have the quality good, because the breaking of one wire takes away a considerable portion of the total strength.

## SWEDISH CHARCOAL IRON.

Trade number	Price in cents per foot	Diameter in inches	Approximate circumference in inches	Weight per foot in pounds	Approximate breaking strain in tons of 2,000 pounds	Allowable working strain in tons of 2,000 pounds	Minimum size of drum or sheave in feet
11	51	1	4 $\frac{1}{2}$	3.55	34	6.80	13
12	43	1	4 $\frac{1}{4}$	3.00	29	5.80	12
13	36	1	4	2.45	24	4.80	10 $\frac{1}{2}$
14	29	1	3 $\frac{3}{4}$	2.00	20	4.00	9 $\frac{1}{2}$
15	23	1	3	1.58	16	3.20	8 $\frac{1}{2}$
16	17 $\frac{1}{2}$	1	2 $\frac{3}{4}$	1.20	12	2.40	7 $\frac{1}{2}$
17	14	1	2 $\frac{1}{2}$	0.89	9.3	1.86	6 $\frac{1}{2}$
18	12	1	2 $\frac{1}{4}$	0.75	7.9	1.58	6
19	10	1	2	0.62	6.6	1.32	5 $\frac{1}{2}$
20	8	1	1 $\frac{3}{4}$	0.50	5.3	1.06	4 $\frac{1}{2}$
21	6 $\frac{1}{2}$	1	1 $\frac{1}{2}$	0.39	4.2	0.84	4
22	5 $\frac{1}{2}$	1	1 $\frac{1}{4}$	0.30	3.3	0.66	3 $\frac{1}{2}$
23	4 $\frac{1}{2}$	1	1 $\frac{1}{2}$	0.22	2.4	0.48	2 $\frac{1}{2}$
24	3 $\frac{1}{2}$	1	1	0.15	1.7	0.34	2 $\frac{1}{2}$
25	3 $\frac{1}{2}$	1	1	0.125	1.4	0.28	2 $\frac{1}{2}$

## CAST STEEL.

Trade number	Price in cents per pound	Diameter in inches	Approximate circumference in inches	Weight per foot in pounds	Approximate breaking strain in tons of 2,000 pounds	Allowable working strain in tons of 2,000 pounds	Minimum size of drum or sheave in feet
11	60	1	4 $\frac{1}{2}$	3.55	34	6.80	13
12	51	1	4 $\frac{1}{4}$	3.00	29	5.80	12
13	43	1	4	2.45	24	4.80	10 $\frac{1}{2}$
14	36	1	3 $\frac{3}{4}$	2.00	20	4.00	9 $\frac{1}{2}$
15	29	1	3	1.58	16	3.20	8 $\frac{1}{2}$
16	22	1	2 $\frac{3}{4}$	1.20	12	2.40	7 $\frac{1}{2}$
17	17	1	2 $\frac{1}{2}$	0.89	9.3	1.86	6 $\frac{1}{2}$
18	13	1	2 $\frac{1}{4}$	0.75	7.9	1.58	6
19	11	1	2	0.62	6.6	1.32	5 $\frac{1}{2}$
20	9	1	1 $\frac{3}{4}$	0.50	5.3	1.06	4 $\frac{1}{2}$
21	7 $\frac{1}{2}$	1	1 $\frac{1}{2}$	0.39	4.2	0.84	4
22	6 $\frac{1}{2}$	1	1 $\frac{1}{4}$	0.30	3.3	0.66	3 $\frac{1}{2}$
23	5 $\frac{1}{2}$	1	1 $\frac{1}{2}$	0.22	2.4	0.48	2 $\frac{1}{2}$
24	4 $\frac{1}{2}$	1	1	0.15	1.7	0.34	2 $\frac{1}{2}$
25	4	1	1	0.125	1.4	0.28	2 $\frac{1}{2}$





## GALVANIZED IRON WIRE ROPE.



Galvanized Wire Rope for derricks and stays is now universally superseding Manila rope for the following reasons: It is much cheaper, more durable, and will not stretch permanently under great strain, as is the case with Manila, thus saving much labor in setting up; and it is fully as elastic as Manila rope of equivalent size. The great economy of using wire in place of Manila rope is the large reduction in size and weight, the bulk of wire rope being only one-sixth that of Manila, while the weight is only one-half.

## GALVANIZED IRON WIRE ROPE

For Ships' Rigging and Derrick Guys.

Composed of 6 Strands and a Hemp Center, 7 or 12 Wires to the Strand.

Price in Cents Per Foot		Approximate diameter in inches	Circumference in inches	Weight per foot in pounds	Approximate breaking strain in pounds	Circumference in inches	Weight per foot in pounds	Approximate breaking strain in pounds	Circumference in inches	Weight per foot in pounds	Approximate breaking strain in pounds	Circumference in inches	Weight per foot in pounds	Approximate breaking strain in pounds	Circumference in inches	Weight per foot in pounds	Approximate breaking strain in pounds
With 7 wires to the strand	With 12 wires to the strand																
44	46	1 3/4	5 1/2	4.85	44.	11	8	10 1/2	9	2 1/2	0.81	7.3	4 1/2	10 1/2	5 1/2	4.85	44.
41	43	1 1/2	5 1/4	4.40	40.	10 1/2	8	10	8	2	0.64	5.8	4 1/4	10	5 1/4	4.40	40.
38	40	1 1/4	5	4.00	36.	10	7 1/2	9 1/4	7 1/2	1 3/4	0.49	4.4	3 3/4	9 1/4	4	3.60	32.
35	37	1 1/4	4 3/4	3.60	32.	9 1/4	6	8	6	1 1/2	0.36	3.2	3	8	3 3/4	3.25	29.
31	33	1 1/4	4 1/2	2.90	26.	8 1/2	5	7 1/4	5	1 1/4	0.25	2.3	2 3/4	7 1/4	3	2.90	26.
27	29	1 1/4	4 1/4	2.55	22.	8	4 1/2	6 1/2	4 1/2	1	0.16	1.4	2	6 1/2	2 3/4	2.55	22.
24	25	1 1/4	4	2.25	20.	7 1/4	4	6	4	3/4	0.16	1.4	2	6	2 1/4	2.25	20.
21	22	1 1/4	3 3/4	1.95	18.	6 1/2	3 1/2	5 1/2	3 1/2	3/4	0.16	1.4	2	5 1/2	2 1/4	1.95	18.
18	19	1 1/4	3 1/2	1.70	15.	6	3	5	3	3/4	0.16	1.4	2	5	2 1/4	1.70	15.
16	17	1 1/4	3	1.44	13.	5 1/2	2 1/2	4 1/2	2 1/2	3/4	0.16	1.4	2	4 1/2	2 1/4	1.44	13.
14	15	1	2 3/4	1.21	11.	5 1/4	2 1/4	4 1/4	2 1/4	3/4	0.16	1.4	2	4 1/4	2 1/4	1.21	11.
12	13	1	2 1/2	1.00	9.0	5	2	4	2	3/4	0.16	1.4	2	4	2 1/4	1.00	9.0

Note.—When made with Wire center, add 10 per cent. to price per foot.

## SWEDES IRON TILLER ROPES.



Tiller Ropes are used for steering ropes on river steamers, for hand ropes on elevators, and in any place where a smooth and extremely flexible rope is required. They are composed of 252 wires, and are made up of a hemp core, around which are twisted six ropes, each of which consists of six strands, including a hemp center. They will pass around very small pulleys and sheaves. The wires are necessarily very fine, and should not be subjected to scraping of any kind or much frictional wear.

Diameter. 1 1/4 3/4 3/8 9/16 1/2 7/16 5/16 1/8  
Iron.....33 27 22 17 14 11 10 9 8 7 1/2  
Cast steel..43 36 30 24 19 17 14 12 11

## GALVANIZED STEEL WIRE STRAND.



For Smokestack Guys, Signal Strand, Trolley Line Span Wire, and Other Purposes.

Composed of 7 Wires Twisted Together.

Price in cents per 100 feet	Diameter in inches	Weight per 100 feet in pounds	Approximate breaking strain in pounds
315	1 1/2	52	8,320
250	1 1/4	40	6,000
200	1 1/4	30	4,700
160	1 1/4	22	3,300
115	1 1/4	13	1,750
80	1 1/4	8	1,000
60	1 1/4	5	700
45	1 1/4	3.50	375
35	1 1/4	2.25	320

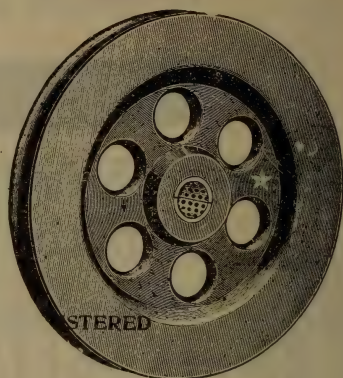
## COPPER, IRON, TINNED AND GALVANIZED SASH CORDS.

Composed of 6 Strands and a Cotton Center, 7 Wires to the Strand.

Trade No.	Price in cents per foot			Diameter in inches	Weight per foot in pounds		Approximate breaking strain in pounds		
	Iron	Tinned or galvanized iron	Copper		Iron	Copper	Iron		
							Bright	An'l'd	Bright Copper
26	3	4	9	1/4	0.100	0.115	2,200	1,600	1,265
27	2 3/4	3 3/4	7 1/2	1/4	0.078	0.087	1,809	1,254	1,022
27 1/2	2 1/4	3	6	1/4	0.056	0.064	1,417	947	762
28	1 3/4	2 1/2	4 1/2	1/4	0.026	0.029	790	467	435
28 1/2	1 1/2	2	3 3/4	1/4	0.014	0.016	510	280	272
29	1 1/4	1 3/4	3	1/4	0.006	0.007	262	132	140

Annealed cords same price as bright cords.

## IRON SHEAVES FOR WIRE ROPE.



Size.	Thickness at Hub.	Size Wire.	Common.	Metaline Bushed.
6 x 1 x $\frac{3}{4}$	$1\frac{1}{8}$ inch.	$\frac{1}{2}$ inch.	\$ .75	\$2.10
*6 x $1\frac{1}{2}$ x $\frac{3}{4}$	$1\frac{1}{8}$ "	$\frac{3}{4}$ "	.90	2.50
7 x 1 x $\frac{3}{4}$	$1\frac{1}{8}$ "	$\frac{1}{2}$ "	1.00	2.30
*7 x $1\frac{1}{8}$ x $\frac{3}{4}$	$1\frac{1}{2}$ "	$\frac{3}{8}$ "	1.10	2.65
8 x 1 x $\frac{7}{8}$	$1\frac{3}{8}$ "	$\frac{1}{2}$ "	1.15	2.85
*†8 x $1\frac{1}{4}$ x $\frac{7}{8}$	$1\frac{3}{8}$ "	$\frac{3}{8}$ "	1.25	3.25
*8 x $1\frac{1}{2}$ x $\frac{7}{8}$	$1\frac{1}{8}$ "	$\frac{3}{4}$ "	1.55	3.75
9 x 1 x $\frac{7}{8}$	$1\frac{7}{8}$ "	$\frac{1}{2}$ "	1.30	3.25
*9 x $1\frac{1}{8}$ x $\frac{7}{8}$	$1\frac{1}{2}$ "	$\frac{3}{8}$ "	1.75	4.00
*9 x $1\frac{1}{2}$ x $\frac{7}{8}$	$1\frac{3}{8}$ "	$\frac{3}{4}$ "	1.85	4.30
9 x $1\frac{1}{8}$ x $\frac{7}{8}$	$1\frac{1}{8}$ "	$\frac{7}{8}$ "	2.05	4.50
*†10 x $1\frac{1}{4}$ x 1	$1\frac{7}{8}$ "	$\frac{3}{8}$ "	2.65	4.00
*10 x $1\frac{1}{2}$ x 1	$1\frac{3}{8}$ "	$\frac{3}{4}$ "	2.75	4.50
*†12 x $1\frac{1}{2}$ x $1\frac{1}{8}$	$1\frac{3}{4}$ "	$\frac{3}{4}$ "	3.25	6.00
*†14 x $1\frac{1}{2}$ x $1\frac{1}{4}$	$1\frac{3}{4}$ "	$\frac{7}{8}$ "	4.20	7.75
16 x $1\frac{1}{2}$ x $1\frac{1}{2}$	$1\frac{3}{4}$ "	$\frac{7}{8}$ "	4.40	8.50
*†16 x $1\frac{3}{4}$ x $1\frac{1}{2}$	2 "	1 "	6.50	9.00
18 x $1\frac{1}{2}$ x $1\frac{1}{2}$	$1\frac{3}{4}$ "	$\frac{7}{8}$ "	6.75	10.00
*†18 x $1\frac{3}{4}$ x $1\frac{1}{2}$	2 "	1 "	7.85	10.90
20 x $1\frac{3}{4}$ x $1\frac{1}{2}$	2 "	$\frac{7}{8}$ "	8.05	12.25
22 x $1\frac{3}{4}$ x $1\frac{1}{2}$	2 "	$\frac{7}{8}$ "	9.65	13.60
24 x $1\frac{3}{4}$ x $1\frac{1}{2}$	2 "	$\frac{7}{8}$ "	11.90	16.50
24 x 2 x $1\frac{1}{2}$	$2\frac{1}{8}$ "	$1\frac{1}{8}$ "	10.00	16.50

\* Extra heavy pattern with deep rim.

† Regular pattern.

All other sizes can be had at short notice.

Where larger pin hole is required, add 50 cents for each one-eighth.

## LISTS OF BLOCKS FOR WIRE ROPE.

Loose Hooks, Shackles, Stiff Swivel Hooks.



DIAMOND PATTERN No. 210.



DIAMOND PATTERN No. 211.

For Blocks with Loose Swivel Hooks, add \$3.50 each to the list price.

## IRON BUSHED.

Size Sheave.	Wire Rope.	Single.	Double.	Triple.
10 x 1 $\frac{1}{4}$ x 1	$\frac{1}{2}$ and $\frac{3}{8}$	\$14.00	\$20.00	\$28.00
12 x 1 $\frac{1}{2}$ x 1 $\frac{1}{8}$	$\frac{3}{8}$ " $\frac{3}{4}$	16.00	23.00	31.00
14 x 1 $\frac{1}{2}$ x 1 $\frac{1}{4}$	$\frac{3}{4}$ " $\frac{7}{8}$	18.00	25.00	36.00
16 x 1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	$\frac{7}{8}$	31.00	40.00	46.00
18 x 1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	1 inch.	34.50	45.00	53.00

## METALINE BUSHED.

Size Sheave.	Wire Rope.	Single.	Double.	Triple.
10 x 1 $\frac{1}{4}$ x 1	$\frac{1}{2}$ and $\frac{3}{8}$	\$17.00	\$26.00	\$37.00
12 x 1 $\frac{1}{2}$ x 1 $\frac{1}{8}$	$\frac{3}{8}$ " $\frac{3}{4}$	19.00	29.00	41.00
14 x 1 $\frac{1}{2}$ x 1 $\frac{1}{4}$	$\frac{3}{4}$ " $\frac{7}{8}$	21.00	31.00	45.00
16 x 1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	$\frac{7}{8}$	36.00	50.00	62.00
18 x 1 $\frac{3}{4}$ x 1 $\frac{1}{2}$	1 inch.	40.00	56.00	68.00

## HARCOURT'S PAT. INSIDE IRON STRAPPED BLOCKS

With Lignumvitæ or Iron Sheaves, Loose Hooks.



LOOSE HOOK AND BECKET. Style No. 4.



LOOSE HOOK AND BECKET. Style No. 5.



LOOSE HOOK AND BECKET. Style No. 6.



LOOSE HOOK. Style No. 7.



LOOSE HOOK. Style No. 9.



DIMENSIONS.				IRON BUSHED			PATENT ROLLER BUSHED		
Size Sheave.	For Dia. Rope.	Size.	Mortise.	Single.	Double.	Triple.	Single.	Double.	Triple.
1 3/4 x 1 1/2 x 3/8	3/8	3	1/8	\$0.70	\$1.30	\$1.75	\$1 10	\$2.00	\$2.90
2 x 1 1/2 x 3/8	3/8	3 1/2	1/8	0.75	1.45	2.00	1.15	2.20	3.15
2 1/4 x 1 1/2 x 3/8	1/2	4	1/8	0.85	1.60	2.15	1.20	2.25	3.25
3 x 1 1/2 x 3/8	3/8	5	1/8	0.90	1.75	2.25	1.25	2.35	3.50
3 1/2 x 1 1/2 x 3/8	3/8	6	1 1/8	1.10	2.00	2.90	1.50	2.85	4.40
4 1/4 x 1 1/2 x 3/8	7/8	7	1 1/8	1.30	2.40	3.50	1.70	3.35	5.00
4 3/4 x 1 1/2 x 3/8	1	8	1 1/4	1.65	2.85	4.25	2.25	4.15	6.00
5 1/2 x 1 1/2 x 3/8	1	9	1 1/4	1.85	3.40	4.75	2.50	4.70	7.25
6 1/4 x 1 1/2 x 3/8	1 1/8	10	1 3/8	2.75	4.50	6.25	3.50	6.00	8.50
7 1/4 x 1 1/2 x 3/8	1 1/8	11	1 3/8	Same	list as	12 inch.	Same	list as	12 inch.
8 x 1 3/8 x 3/4	1 1/4	12	1 3/8	4.45	7.50	10.65	5.30	9.20	13.20
9 x 1 1/2 x 3/4	1 1/4	13	1 1/2	Same	list as	14 inch.	Same	list as	14 inch.
9 1/2 x 1 1/2 x 3/4	1 3/8	14	1 3/4	7.00	10.50	15.00	8.15	12.80	18.45
10 x 1 1/2 x 7/8	1 1/2	15	1 3/4	8.00	13.00	18.00	9.25	15.50	21.75
11 x 1 3/4 x 7/8	1 3/8	16	1 3/4	10.00	15.00	22.00	11 50	18 00	26 50



WE also carry a full assortment of Iron Strapped Snatch Blocks of the latest and most approved pattern, as per cut shown, which for simplicity in construction, ease in working, and durable qualities of same, outrank any other style of snatch block in the market.

The chief merits of this snatch block are as follows

1. The construction of the **LIP** and **LINK**, which admits of being so easily locked and unlocked by turning the hook to a certain angle, that no trouble will be experienced in its working

2. The only snatch block in the market with two bow straps, one on the inside and one on the outside; same being covered by letters patent

3. The two outside straps are secured at the bottom by a **BOLT**, which prevents the mortise pinching together and binding the sheaves, as often happens in all other styles, thus making the block as rigid and firm as if all made of iron

4. We have added an improvement lately, by having a **ROCKER** or **HINGE** on one side and a **BAR ACROSS THE LINK**, thus making it so securely self-locking that, no matter in what position it may be, it would be impossible to shake the clasp open. Our snatch blocks have larger and wider sheaves than the same size of any other make, enabling a larger rope to be used.

### STAR SNATCH BLOCKS (Boston Pattern).



No. 18.



No. 126.

### IMPROVED IRON STRAPPED SELF-LOCKING LINK SNATCH BLOCK (Cross Bolted, with Swivel Hook and Bail).

Size Sheave.	For Dia. Rope.	Size Shell.	Ford's Pat. Bushed.	Self-adjusting 5-Roller Bushed.	Self-lubricating Metaline Bushed.
3 x 1½ x ½	¾	6 inches.	\$4.00	\$4.65	\$5.25
3½ x 1½ x ½	¾	7 "	4.75	5.50	6.00
4½ x 1½ x ¾	1	8 "	5.75	6.60	7.25
5 x 1½ x ¾	1½	9 "	6.75	7.75	8.50
5½ x 1½ x ¾	1½	10 "	8.50	10.00	11.00
6¾ x 2½ x ¾	1½	12 "	10.00	11.50	13.00
8 x 2½ x ¾	1¾	14 "	13.00	15.00	16.50
9 x 2½ x 1	2	16 "	17.00	20.00	22.00
10 x 3 x 1½	2½	18 "	25.00	28.50	31.00
11 x 3½ x 1½	2½	20 "	38.00	43.00	46.00
11½ x 4½ x 1½	3	22 "	55.00	63.00	68.00
12½ x 4½ x 1½	3½	24 "	70.00	78.00	86.00

Would highly recommend our Metaline Snatch Blocks as the most reliable, as they save the sheave and pin from wearing, the bushing being the life of the block.

# SOMETHING NEW.

## STAR MALLEABLE IRON BLOCK.



They are light but strong, and while they last much longer they cost but a very little more than wood blocks.

The sheaves run on steel pins, with nuts, which are easily removed.

The block is so constructed that the edge of the sheaves cannot wear sharp; and as the edges and middles are rounded, the wear of the rope is saved.

The "Baby" size takes  $\frac{1}{4}$  in. rope; will test to over 500 lbs.; while Uncle Sam's mail will carry a sample to you for six cents.

Size Block.	For. Dia. Rope.	Iron Bushed.		Patent Bushed.	
		Single.	Double.	Single.	Double.
2 inch.	$\frac{1}{4}$ inch.	\$ .45	\$ .70		
2½ "	$\frac{3}{8}$ "	.45	.70		
3 "	$\frac{1}{2}$ "	.50	.75	\$ .65	\$1.00
4 "	$\frac{5}{8}$ "	.65	.90	.85	1.25
5 "	$\frac{3}{4}$ "	.85	1.25	1.00	1.65
6 "	$\frac{7}{8}$ "	1.15	1.85	1.40	2.25
8 "	1 "	1.65	2.50	2.00	3.15

## CHAINS.

PROOF TESTED—B. B. COIL CHAIN—B. B. B. COIL CHAIN—DREDGE CHAIN



Straight Link Coil Chain.

Estimated Strength (in lbs.) for Coil Chain.

Size of Chain, inch.	Proof Test in lbs. for "B. B." Chain	Proof Test in lbs. for "B. B. B." Chain	Proof Test in lbs. for Dredge Chain	Size of Chain, inch.	Proof Test in lbs. for "B. B." Chain	Proof Test in lbs. for "B. B. B." Chain	Proof Test in lbs. for Dredge Chain
$\frac{3}{16}$	1000	1250	1350	1	30120	34100	35500
$\frac{1}{4}$	2000	2350	2450	$1\frac{1}{16}$	33000	38100	40750
$\frac{5}{16}$	2800	3300	3500	$1\frac{1}{8}$	36150	44130	46000
$\frac{3}{8}$	4450	5200	5500	$1\frac{3}{16}$	38500	47130	49000
$\frac{7}{16}$	5650	6540	7100	$1\frac{1}{2}$	42130	52160	54000
$\frac{1}{2}$	7100	8550	9550	$1\frac{5}{8}$	45000	56200	58500
$\frac{9}{16}$	8900	10800	12500	$1\frac{3}{4}$	48200	62200	64000
$\frac{5}{8}$	12000	14800	16000	$1\frac{7}{8}$	51500	67000	70000
$\frac{11}{16}$	14500	17000	18500	1 $\frac{15}{16}$	56190	74120	77000
$\frac{3}{4}$	18070	22000	23000	1 $\frac{1}{2}$	61000	77500	82000
$\frac{7}{8}$	21000	24000	25000	$1\frac{1}{8}$	68170	84090	88000
$\frac{15}{16}$	24100	27110	28500	$1\frac{1}{4}$	74100	88200	93000
$1\frac{1}{16}$	27000	29200	31000	$1\frac{1}{2}$	82000	93000	98500

## ESTIMATED WEIGHT COMMON STRAIGHT LINK COIL CHAIN

PER 100 FEET.

SIZE CHAIN—INCH	WEIGHT	SIZE CHAIN—INCH	WEIGHT
3-16 .....	50	7-8 .....	800
1-4 .....	75	15-16 .....	900
5-16 .....	110	1 .....	1,000
3-8 .....	155	1 1-16 .....	1,100
7-16 .....	200	1 1-8 .....	1,300
1-2 .....	265	1 3-16 .....	1,400
9-16 .....	325	1 1-4 .....	1,500
5-8 .....	420	1 5-16 .....	1,750
11-16 .....	500	1 3-8 .....	1,900
3-4 .....	590	1 7-16 .....	2,000
13-16 .....	700	1 1-2 .....	2,100

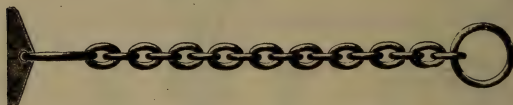
## TWIST COIL CHAIN

We make TWIST COIL CHAIN in all sizes up to and including  $\frac{3}{4}$  inch.

# Rafting Chain



With long link on each end, to connect with shackles. Usual sizes,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 inch.

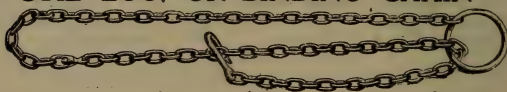


With ring on one end, and Toggle on the other. Usual sizes,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 inch.



With Toggle on each end. Usual sizes,  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , 1 inch. Made any length desired.

## COIL LOG, OR BINDING CHAIN



Size Iron .....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
Self-Colored, per pound .....	16	16	16	16	16	16
Polished, per pound .....	16	16	16	16	16	16



Size Iron .....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
Polished, per pound .....	16	16	16	16	16	16



## LONG LINK LOG.

Size Iron .....	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$\frac{1}{2}$	$\frac{3}{4}$
Polished per pound .....	16	16	16	16	16	16

Regular lengths, 12 to 14 feet, will be sent, unless otherwise specified in order.



## CHAINS.

## Railroad Chains.

ANY STYLE R. R. CHAIN MADE TO ORDER.



CAR BRAKE CHAIN

## Railroad Switch, or Wrecking Chain

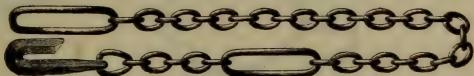


Grab Hook on one end, Long Link on other end

Sizes .....

 $\frac{1}{2}$  $\frac{3}{4}$ 

1 inch



STYLE B

Grab Hook on one end, with two Long Links.

Sizes .....

 $\frac{1}{2}$  $\frac{3}{4}$ 

1 inch



STYLE C

Above Chains made any length desired.

## Safety Chains.



# COW TIES



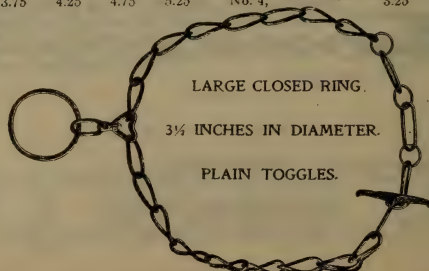
Heavy Distiller's Cow Ties, 12 Links per foot.

$\frac{5}{16}$ in. length 6 feet.....	Price per doz, \$9 00
No. 1 " " .....	" " 8 00
No. 2 " " .....	" " 7 00



Ohio Pattern, 7 Links per foot.

Length,	4½ ft.	5 ft.	5½ ft.	6 ft.	Length,	4½ ft.	5 ft.	5½ ft.	6 ft.
No. 1, Price per doz.	\$4 00	4.50	5.00	5.50	No. 3, Price per doz.	\$3.50	4.00	4.50	5.00
No. 2, " " "	3.75	4.25	4.75	5.25	No. 4, " " "	3.25	3.75	4.25	4.75



No. 1, Length 3½ feet .....	Price per doz., \$4 50	No. 3, Length 3½ feet .....	Price per doz., \$4 00
No. 2, " " " .....	" " 4.25	No. 4, " " " .....	" " 3.75

## JOINING SHACKLE FOR CABLE CHAIN



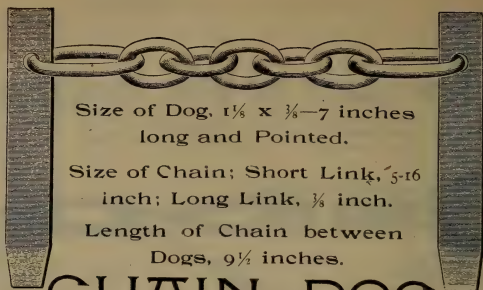
Made of 7-16 to  $2\frac{3}{4}$  inch Iron.

When ordering, state Size of Chain the Shackles are for. Joining Shackles are of  $\frac{1}{8}$  to  $\frac{1}{4}$  larger than size iron in Chain, according to the size of Chain used.



# Cold Shuts

[illegible]



Size of Dog,  $1\frac{1}{2}$  x  $\frac{3}{8}$ —7 inches  
long and Pointed.

Size of Chain; Short Link,  $\frac{5}{16}$  inch; Long Link,  $\frac{1}{2}$  inch.

Length of Chain between  
Dogs,  $9\frac{1}{2}$  inches.

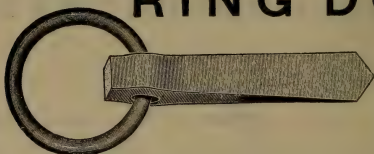
## CHAIN DOG

Also made with Three Short Links of Chain, when desired.

Other Sizes Made to Order.

(SQUARE PATTERN)

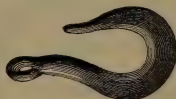
## RING DOG



3-4 inch Dog with 3 x 7-16 Ring	✱	1 inch Dog with 3 1-2 x 9-16 Ring
7-8 " " " 3 x 1-2 "	✱	1 1-8 " " 3 1-2 x 5-8 "

We also make with Flat Iron, Dog 1 1-4 or 1 1-2 inch wide and 3-8, 7-16 or 1-2 inch in thickness

## SLIP HOOK FOR LOG CHAIN



No. 1

## SQUARE GRAB HOOK

FOR LOG CHAIN



No. 2

## FLAT GRAB HOOK

FOR LOG CHAIN



No. 3

Made Polished or Self-colored. When ordering Hooks, always state size of Chain the Hooks are for.



## Pike and Hook.

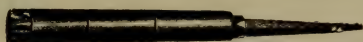


We are, beyond a doubt, Headquarters for Pike Poles.

No.	260.	10 feet Pike and Hook, per dozen	\$18 00
"	261.	12 " " " "	20 00
"	262.	14 " " " "	21 00
"	263.	16 " " " "	23 00
"	264.	18 " " " "	25 00
"	265.	20 " " " "	28 00

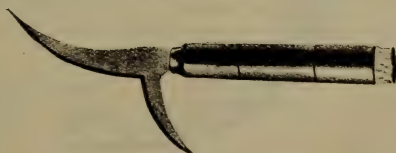
We make our own Poles which we believe none of our competitors do, as they are not located in a country where ash timber grows.

## Straight Pike.



No.	266.	10 feet, Pike only, per dozen	\$16 00
"	267.	12 " " " "	17 00
"	268.	14 " " " "	18 00
"	269.	16 " " " "	20 00
"	270.	18 " " " "	22 00
"	271.	20 " " " "	26 00

## Pickeroon.



Prices Same as Pike and Hook.

Our Poles are all made from the best quality of second growth *White Ash*, all the material being carefully selected and none but the best used for these goods.

The Pikes and Hooks are made from crucible steel. The ferrules are made seamless from Norway iron, and are very strong. Hooks are screwed into the poles (not driven), and can not possibly come loose.

Order by Number.

## Cant Hook and Peavy Handles.



We claim superior advantages for producing choice handles of all kinds. We have with us an abundance of timbers such as are used in the manufacture of Logging Tool Handles, viz., *Hickory, Rock Maple and Ash*. We consider a *Hickory Handle* will outwear two handles made from Rock Maple. While it is true they cost a trifle more money, still they are the cheaper handle.

### PRICE LIST.

#### Selected Hickory Handles.

No. 252.	2½ in. x 4½ feet, per dozen	\$4 00
	2½ in. x 5 " "	4 30
	2½ in. x 5½ " "	4 70
	2½ in. x 6 " "	5 10

#### Selected Rock Maple Handles.

No. 253.	2½ in. x 4 feet, per dozen	\$3 20
	2½ in. x 4½ " "	3 40
	2½ in. x 5 " "	3 70
	2½ in. x 5½ " "	4 00

For larger handles add 25 cents per dozen for each additional ¼ inch in

## Pike Poles—No Irons.

We carry a large stock of these goods in all lengths, and can fill any orders promptly. They are finished with *Linseed Oil*, which gives them a good appearance and also preserves the timber. Nothing but the "*Cream*" of the timber goes into these goods—all second growth, straight grained white ash.

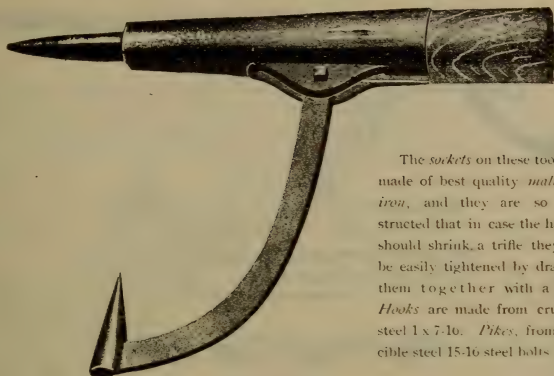
### PRICE LIST.

No. 254.	10 feet Pike Poles (no irons), per dozen	\$ 7 00
" 255.	12 " " " "	8 00
" 256.	14 " " " "	9 00
" 257.	16 " " " "	12 00
" 258.	18 " " " "	15 00
" 259.	20 " " " "	18 00

We claim a Hickory Handle has Twice the Strength of any other.



## Split Socket Peavy—Round Bill.



The *sockets* on these tools are made of best quality *malleable iron*, and they are so constructed that in case the handle should shrink, a trifle they can be easily tightened by drawing them together with a bolt. *Hooks* are made from crucible steel 1 x 7-16. *Pikes*, from crucible steel 15-16 steel bolts.

## PRICE LIST.

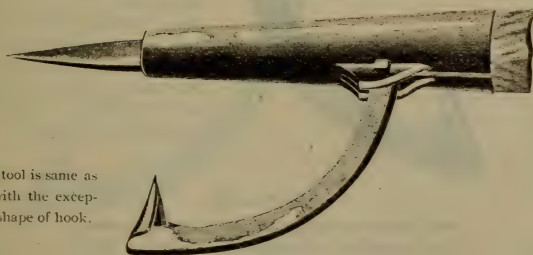
## With Selected Hickory Handles, Round Bill Hooks.

No. 200.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$22 50
" 201.	2½ in. x 4½, 5, 5½ or 6 " " "	25 50
" 202.	3 in. x 4½, 5, 5½ or 6 " " "	28 00

## With Selected Rock Maple Handles, Round Bill Hooks.

No. 203.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$21 00
" 204.	2½ in. x 4½, 5, 5½ or 6 " " "	23 50
" 205.	3 in. x 4½, 5, 5½ or 6 " " "	26 00

## Split Socket Peavy—Duck Bill.



This tool is same as above with the exception of shape of hook.

## PRICE LIST.

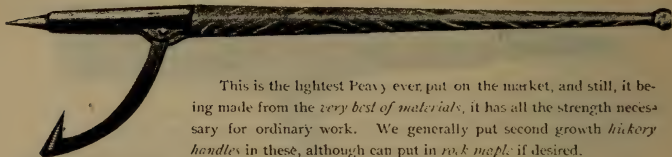
## With Selected Hickory Handles, Duck Bill Hooks.

No. 206.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$22 50
" 207.	2½ in. x 4½, 5, 5½ or 6 " " "	25 50
" 208.	3 in. x 4½, 5, 5½ or 6 " " "	28 00

## With Selected Rock Maple Handles, Duck Bill Hooks.

No. 209.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$21 00
" 210.	2½ in. x 4½, 5, 5½ or 6 " " "	23 50
" 211.	3 in. x 4½, 5, 5½ or 6 " " "	26 00

## Little Dandy Peavy.



This is the highest Peavy ever put on the market, and still, it being made from the *very best of materials*, it has all the strength necessary for ordinary work. We generally put second growth *hickory handles* in these, although can put in *rock maple* if desired.

### PRICE LIST.

With Selected Hickory Handles, Round or Duck Bill Hooks.

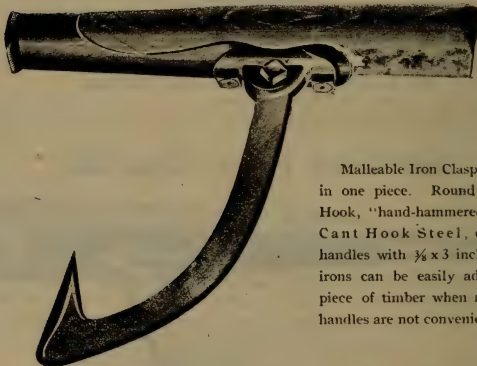
No. 224.  $2\frac{1}{4}$  in. x 4,  $4\frac{1}{2}$  or 5 feet handles, per dozen..... \$21 50

With Selected Rock Maple Handles, Round or Duck Bill Hooks.

No. 225. 2 $\frac{1}{2}$  in. x 4,  $4\frac{1}{2}$  or 5 feet handles, per dozen..... \$20 00

Weight, Eight Pounds

## The Handy Cant Hook.



Malleable Iron Clasp and Toe Ring in one piece. Round or Duck Bill Hook, "hand-hammered," of 1 x 7-16 Cant Hook Steel, clasp bolted to handles with  $\frac{3}{8}$  x 3 inch bolts. The irons can be easily adjusted to any piece of timber when regular shaped handles are not convenient.

### PRICE LIST.

With Selected Hickory Handles, Round or Duck Bill Hooks.

No. 226.	$2\frac{1}{4}$ in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 feet handles, per dozen .....	\$19 00
" 227.	$2\frac{3}{4}$ in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 " " " .....	20 50
" 228.	3 in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 " " " .....	22 50

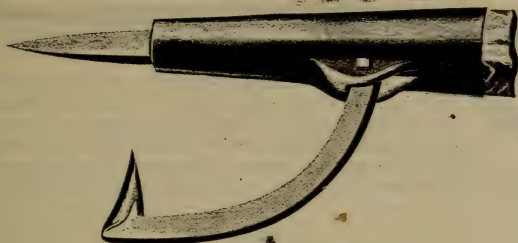
With Selected Rock Maple Handles, Round or Duck Bill Hooks.

No. 229.	$2\frac{1}{4}$ in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 feet handles, per dozen.....	\$17 50
" 230.	$2\frac{3}{4}$ in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 " " " .....	19 00
" 231.	3 in. x $4\frac{1}{2}$ , 5, $5\frac{1}{2}$ or 6 " " " .....	21 00

We claim that a Hickory Handle has Twice the Strength of any other.



## Solid Socket Peavy—Duck Bill.



## PRICE LIST.

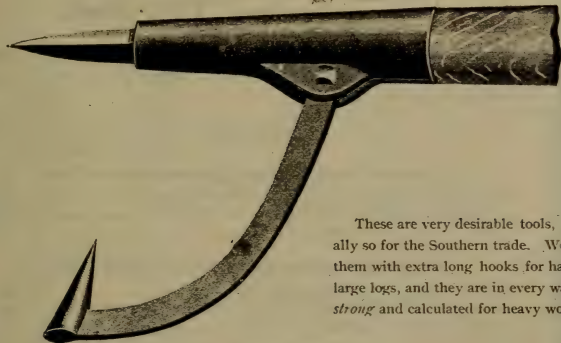
With Select Hickory Handles, Round or Duck Bill Hooks.

No. 212.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$22 50
" 213.	2½ in. x 4½, 5, 5½ or 6 " " "	25 50
" 214.	3 in. x 4½, 5, 5½ or 6 " " "	28 00

With Select Rock Maple Handles, Round or Duck Bill Hooks.

No. 215.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$21 00
" 216.	2½ in. x 4½, 5, 5½ or 6 " " "	23 50
" 217.	3 in. x 4½, 5, 5½ or 6 " " "	26 00

## Solid Socket Peavy—Round Bill.



These are very desirable tools, especially so for the Southern trade. We make them with extra long hooks for handling large logs, and they are in every way *very strong* and calculated for heavy work.

## PRICE LIST.

With Select Hickory Handles, Round or Duck Bill Hooks.

No. 218.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$22 50
" 219.	2½ in. x 4½, 5, 5½ or 6 " " "	25 50
" 220.	3 in. x 4½, 5, 5½ or 6 " " "	28 00

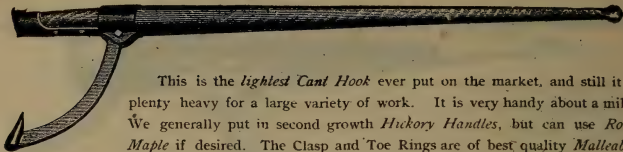
With Select Rock Maple Handles, Round or Duck Bill Hooks.

No. 221.	2½ in. x 4½, 5, 5½ or 6 feet handles, per dozen	\$21 00
" 222.	2½ in. x 4½, 5, 5½ or 6 " " "	23 50
" 223.	3 in. x 4½, 5, 5½ or 6 " " "	26 00

We claim that a Hickory Handle has Twice the Strength of any other.

Order by Number.

## Little Dandy Cant Hook.



This is the *lightest Cant Hook* ever put on the market, and still it is plenty heavy for a large variety of work. It is very handy about a mill. We generally put in second growth *Hickory Handles*, but can use *Rock Maple* if desired. The Clasp and Toe Rings are of best quality *Malleable Iron*. The Hook is best quality *Crucible Steel*. The bolt is steel with square head.

### PRICE LIST.

With Selected Hickory Handles, Round or Duck Bill Hooks.

No. 244. 2½ in. x 4, 4½ or 5 feet handles, per dozen..... \$17 00

With Selected Rock Maple Handles, Round or Duck Bill Hooks.

No. 245. 2½ in. x 4, 4½ or 5 feet handles, per dozen..... \$18 50

## "The Columbus" Cant Hook.

Malleable Iron Clasp with extension Toe Ring, sizes 2½, 2¾ and 3 inches. Made with either Round or Duck Bill Hook, and nothing but the best material is used in any part.

### PRICE LIST.

With Selected Hickory Handles (oiled), Round or Duck Bill Hooks.

No. 246. 2½ in. x 4, 4½, 5 or 5½ feet handles, per dozen..... \$20 00

" 247. 2¾ in. x 4, 4½, 5 or 5½ " " " " 20 50

" 248. 3 in. x 4, 4½, 5 or 5½ " " " " 22 50

With Selected Rock Maple Handles, Round or Duck Bill Hooks.

No. 249. 2½ in. x 4, 4½, 5 or 5½ feet handles, per dozen..... \$17 50

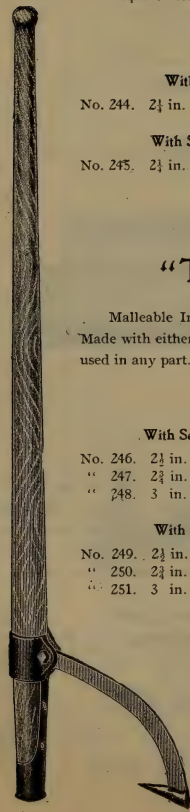
" 250. 2¾ in. x 4, 4½, 5 or 5½ " " " " 19 00

" 251. 3 in. x 4, 4½, 5 or 5½ " " " " 21 00

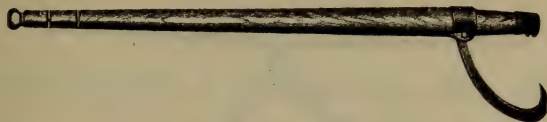
We make a Specialty of Heavy Tools for the  
Pacific Slope and Southern Trade.

We claim a Hickory Handle has Twice the Strength of any Other

Order by Number.



## Little Giant Cant Hook.



Malleable Iron Clasp,  $2\frac{1}{2}$ ,  $2\frac{3}{4}$  and 3 inches, with chisel-shaped hook made from regular "Cant Hook" Crucible Steel,  $1 \times 7-16$ . Bolts  $1\frac{1}{2} \times \frac{1}{2}$  made from steel. *Handles all nicely finished and oiled.*

### PRICE LIST.

#### With Selected Hickory Handles, Chisel-Shaped Hooks.

No. 232.	$2\frac{1}{2}$ in. $\times$ $4\frac{1}{2}$ or 5 feet handles, per dozen	\$16 50
" 233.	$2\frac{3}{4}$ in. $\times$ $4\frac{1}{2}$ or 5 " " "	18 00
" 234.	3 in. $\times$ $4\frac{1}{2}$ or 5 " " "	20 00

#### With Selected Rock Maple Handles, Chisel-Shaped Hooks.

No. 235.	$2\frac{1}{2}$ in. $\times$ $4\frac{1}{2}$ or 5 feet handles, per dozen	\$15 00
" 236.	$2\frac{3}{4}$ in. $\times$ $4\frac{1}{2}$ or 5 " " "	16 50
" 237.	3 in. $\times$ $4\frac{1}{2}$ or 5 " " "	18 50

## The Sampson Cant Hook.

Malleable Iron Clasp and Toe Rings,  $2\frac{1}{2}$ ,  $2\frac{3}{4}$  and 3 inches. Round or Duck Bill Hooks made from  $1 \times 7-16$  Cant Hook Crucible Steel. If wanted from heavier steel will supply at same price.

### PRICE LIST.

#### With Selected Hickory Handles oiled, Round or Duck Bill Hooks.

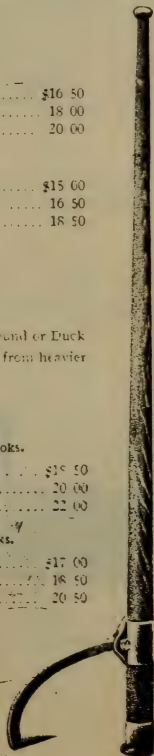
No. 238.	$2\frac{1}{2}$ in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ feet handles, per dozen	\$18 50
" 239.	$2\frac{3}{4}$ in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ " " "	20 00
" 240.	3 in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ " " "	22 00

#### With Selected Rock Maple Handles, Round or Duck Bill Hooks.

No. 241.	$2\frac{1}{2}$ in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ feet handles, per dozen	\$17 00
" 242.	$2\frac{3}{4}$ in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ " " "	18 50
" 243.	3 in. $\times$ $4\frac{1}{2}$ , 5 or $5\frac{1}{2}$ " " "	20 50

**We claim a Hickory Handle has Twice the Strength of any other.**

Order by Number.



## Timber Carrier.



These Hooks are hung in swivels so they will adjust themselves to any angle desired. Hooks are made from crucible steel, and the Swivel and Clip from malleable iron.

### PRICE LIST.

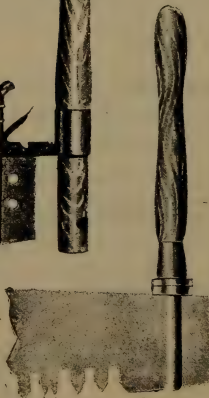
With Selected Hickory or Rock Maple Handles.

No. 272. Per dozen ..... \$28 00

## Saw Handles.



No. 274.  
Same as Atkins' No. 5.



No. 273.  
Climax  
Cross Cut.  
Diston's Pattern.



No. 275.  
Light Loop  
Cross Cut

No. 274. Bell Loop Cross Cut. Atkins' Pattern.

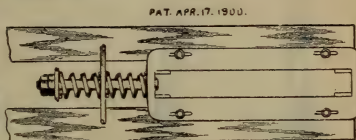
Order by Number.



# QUINN'S

## Spring Cushion Self-Adjusting Floor Plate

*For Double Cylinder Steam Niggers.*



### GUARANTEED

1. To withstand the most rapid and severe handling.
2. That it cushions on the forward and backward throw, doing away with all bumpers.
3. That it will increase the cut of your mill, as the sawyer can handle rapidly, there being no danger of knocking out a floor plate.
4. That a new sawyer can learn to handle without doing any damage.
5. That it will make a great saving in millwright work.
6. That it is easy on the machinery and will not knock the track out of line.
7. That, with a forward pressure, a log can be turned which could not be touched when using the old rigid plate.
8. That it is of steel, cast in one piece—approximate weight 250 pounds.
9. That every plate is fully warranted.
10. That it will give four times the service of any other plate. Ours is the only Floor Plate with a guarantee.

In ordering select from table below, the measurements corresponding to the dimensions of your tooth-bar and width of opening in floor plate. If your measurements do not correspond with those of table, give width of tooth-bar, also width and length of tooth from face of bar. Sent to responsible parties on approval.

When ordering new log turners, ask for Quinn's Floor Plate.

**Price, F. O. B. Cincinnati, \$40.00**

	TOOTH - BAR			FLOOR PLATE
	Thickness of Sides	Width of Tooth	Length of Tooth	Width of Opening
No. 1 .....	1	1½	3 to 3½	4
No. 2 .....	1½	1½	3 to 3½	4½
No. 3 .....	1	2	3 to 3½	4½
No. 4 .....	1½	2	3 to 3½	5
No. 5 .....	1	3	3 to 3½	5½
No. 6 .....	1½	3	3 to 3½	6
No. 7 .....	1	4	3 to 3½	6½
No. 8 .....	1½	4	3 to 3½	7



## PLAIN BACK SHOVELS AND SPADES

"A"

Round and Square Point, D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List, Per Doz.	Size	List, Per Doz.	Size	List, Per Doz.	Size	List, Per Doz.
2	\$17 50	2	\$16 00	2	\$14 50	2	\$13 50
3	18 00	3	16 50	3	15 00	3	14 00
4	18 50	4	17 00	4	15 50	4	14 50
5	19 00	5	17 50	5	16 00	5	15 00
6	19 50	6	18 00	6	16 50	6	15 50
7	20 00	7	18 50	7	17 00	7	16 00
8	20 50	8	19 00	8	17 50	8	16 50

Black, 50 cents less list per dozen.

Moulders' Shovels, regular list.

Lime Shovels, regular list.

Flat Drain Cleaners, regular list.

Malleable D Handle Tamping Shovels, advance list \$2.00 per dozen. Only made in first and second grades.

Irrigating Shovels, with step, advance list \$2.00 per dozen.

## POST, DRAIN—SPADES—DITCHING.



Urban Extra		Hibberd		Gaar	
First Grade		Second Grade		Third Grade	
Polished		Polished		Polished	
Size	List, Per Doz.	Size	List, Per Doz.	Size	List, Per Doz.
14 in	\$21 50	14 in	\$19 50	14 in.	\$17 50
16 "	22 00	16 "	20 00	16 "	18 00
18 "	22 50	18 "	20 50	18 "	18 50
20 "	23 00	20 "	21 00	20 "	19 00
22 "	23 50	22 "	21 50	22 "	19 50

For Dimensions, See Page

ALL OUR GOODS FULLY WARRANTED.



## FATHERLAND DIAMOND-POINTED SPADES.

Tee or D Handle, Polished Only.

Urban Extra, First Grade, Size 2 . . . List, per dozen, \$17 50

## MINING MACHINE OR SLACK SHOVELS.

Plain Back, with Extra Long Stem.

Handles and Malleable D Heads.

Urban Extra		Hibberd	
First Grade		Second Grade	
	List, per Doz.		List, per Doz.
Size 4, Black	\$21 50	Size 4, Black .	\$20 00

## HOLLOW-BACK FURNACE OR HOUSE SCOOPS.

Gaar. Fourth Grade, D or Long Handle.

	Black	Half Polished
Size, 9½ x 14. . . . .	List, per dozen, \$14 00	\$14 20

## HOLLOW-BACK SNOW SHOVELS

Gaar, Long Handle, 11½ x 14. . . . . List, per dozen, \$ 7 00

Gaar, D Handle, 11½ x 14 . . . . . 10 00

## TELEGRAPH SHOVELS.

Back Strap or Riveted.

Urban Extra				Hibberd			
First Grade				Second Grade			
Regular Strap, Black		Extra Long Strap, Black		Regular Strap, Black		Extra Long Strap, Black	
Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.
6 ft.	\$19 00	6 ft.	\$21 00	6 ft.	\$17 50	6 ft.	\$19 50
7 ft.	21 00	7 ft.	23 00	7 ft.	19 50	7 ft.	21 50
8 ft.	23 00	8 ft.	25 00	8 ft.	21 50	8 ft.	23 50

## TELEGRAPH SPOONS.

Urban's Extra. First Grade.

6 ft. Handle, Black . . . . .	List, per dozen, \$22 50
7 ft. Handle, " . . . . .	22 50
8 ft. Handle, " . . . . .	24 50

For Additional Cuts, See Pages

ALL OUR GOODS FULLY WARRANTED.



## BACK STRAP SCOOPS

Narrow Mouth or Eastern Pattern Locomotive and Coal Scoops, D or Long Handle

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.
2	\$19 00	2	\$17 50	2	\$16 00	2	\$15 00
3	19 50	3	18 00	3	16 50	3	15 50
4	20 00	4	18 50	4	17 00	4	16 00
5	20 50	5	19 00	5	17 50	5	16 50
6	21 00	6	19 50	6	18 00	6	17 00
7	21 50	7	20 00	7	18 50	7	17 50
8	22 00	8	20 50	8	19 00	8	18 00
9	22 50	9	21 00	9	19 50	9	18 50
10	23 00	10	21 50	10	20 00	10	19 00
12	24 00	12	22 50	12	21 00	12	20 00

Black, 50 cents less list per dozen.

Half Polished, 30 cents less list per dozen.

## BACK STRAP SCOOPS.

Wide Mouth or Western Pattern Coal and Grain Scoops, D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.	Size	List, per Doz.
1	\$19 50	1	\$18 00	1	\$16 50	1	\$15 50
2	20 00	2	18 50	2	17 00	2	16 00
3	20 50	3	19 00	3	17 50	3	16 50
4	21 00	4	19 50	4	18 00	4	17 00
5	21 50	5	20 00	5	18 50	5	17 50
6	22 00	6	20 50	6	19 00	6	18 00

Black, 50 cents less list per dozen.

Half polished, 30 cents less list per dozen.

For Dimensions, See Page

ALL OUR GOODS FULLY WARRANTED.



## BACK STRAP SHOVELS AND SPADES.

Round or Square Point. D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.
2	\$18 50	2	\$15 00	2	\$13 50	2	\$12 50
3	17 00	3	15 50	3	14 00	3	13 00
4	17 50	4	16 00	4	14 50	4	13 50
5	18 00	5	16 50	5	15 00	5	14 00
6	18 50	6	17 00	6	15 50	6	14 50

Black, 50 cents less list per dozen.

Malleable D Tamping Shovels, advance list \$2.00 per dozen. Only made in first and second grades.

Mining Shovels, both full and half spring, use regular list.

## BACK STRAP COAL AND COKE SHOVELS.

D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Black		Black		Black		Black	
Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.
1 Coal, \$18 50		1 Coal, \$17 00		1 Coal, \$15 50		1 Coal, \$14 50	
2 " 19 00		2 " 17 50		2 " 16 00		2 " 15 00	
3 " 19 50		3 " 18 00		3 " 16 50		3 " 15 50	
4 Coke, 20 00		4 Coke, 18 50		4 Coke, 17 00		4 Coke, 16 00	

Half Polished, advance list 50 cents per dozen.

## BACK STRAP FURNACE OR HOUSE SCOOPS.

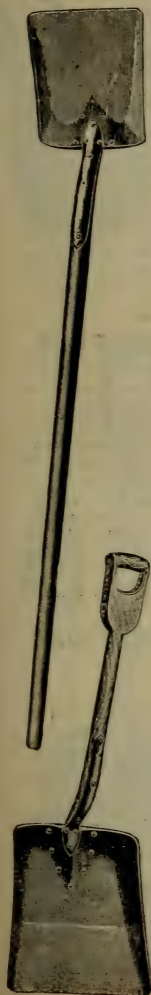
D or Long Handle.

GAAR OR FOURTH GRADE ONLY.

List. per Doz.		List. per Doz.	
No. 00 — Size, 8½ x 13 . . . . .	Black, \$14 00	Half Pol., \$14 20	
No. 0 — Size, 9 x 14 . . . . .	" 14 00	" " 14 20	

For Additional Cuts, See Pages

ALL OUR GOODS FULLY WARRANTED.





## HOLLOW-BACK SHOVELS AND SPADES.

Round or Square Point, D or Long Handle.

Urban Extra		Hibberd		Hoosier.		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.
2	\$17 00	2	\$15 50	2	\$14 00	2	\$13 00
3	17 50	3	16 00	3	14 50	3	13 50
4	18 00	4	16 50	4	15 00	4	14 00
5	18 50	5	17 00	5	15 50	5	14 50
6	19 00	6	17 50	6	16 00	6	15 00
8	20 00	8	18 50	8	17 00	8	16 00

Black, 50 cents less list per dozen.

Tamping Shovels, advance list, \$2.00 per dozen.

## HOLLOW-BACK ORE SHOVELS.

D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Polished		Polished		Polished		Polished	
Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.
4	\$18 00	4	\$16 50	4	\$15 00	4	\$14 00
5	18 50	5	17 00	5	15 50	5	14 50
6	19 00	6	17 50	6	16 00	6	15 00
8	20 00	8	18 50	8	17 00	8	16 00

Black, 50 cents less list per dozen.

## HOLLOW-BACK COAL AND COKE SHOVELS.

D or Long Handle.

Urban Extra		Hibberd		Hoosier		Gaar	
First Grade		Second Grade		Third Grade		Fourth Grade	
Black		Black		Black		Black	
Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.	Size	List. per Doz.
1 Coal, \$18 50		1 Coal, \$17 00		1 Coal, \$15 50		1 Coal, \$14 50	
2 " 19 00		2 " 17 50		2 " 16 00		2 " 15 00	
3 " 19 50		3 " 18 00		3 " 16 50		3 " 15 50	
4 Coke, 20 00		4 Coke, 18 50		4 Coke, 17 00		4 Coke, 16 00	
5 " 20 50		5 " 19 00		5 " 17 50		5 " 16 50	

Half polished, advance list 50 cents per dozen.

For Dimensions, See Page

ALL OUR GOODS FULLY WARRANTED.

## HOLLOW-BACK SCOOPS. *J*

Narrow Mouth or Eastern Pattern Locomotive and Coal, D or Long Handle.

Urban Extra	Hibberd	Hoosier	Gaar
First Grade	Second Grade	Third Grade	Fourth Grade
Polished	Polished	Polished	Polished
Size	List, per Doz.	Size	List, per Doz.
2	\$18 50	2	\$15 50
3	19 00	3	16 00
4	19 50	4	16 50
5	20 00	5	17 00
6	20 50	6	17 50
7	21 00	7	18 00
8	21 50	8	18 50
9	22 00	9	19 00

Black, 50 cents less list per dozen.

Half polished, 30 cents less list per dozen.

## HOLLOW-BACK SCOOPS.

Wide Mouth or Western Pattern Grain, D or Long Handle

Urban Extra	Hibberd	Hoosier	Gaar
First Grade	Second Grade	Third Grade	Fourth Grade
Polished	Polished	Polished	Polished
Size	List, per Doz.	Size	List, per Doz.
4	\$19 50	4	\$16 50
5	20 00	5	17 00
6	20 50	6	17 50
7	21 00	7	18 00
8	21 50	8	18 50
9	22 00	9	19 00
10	22 50	10	19 50
12	23 50	12	20 50

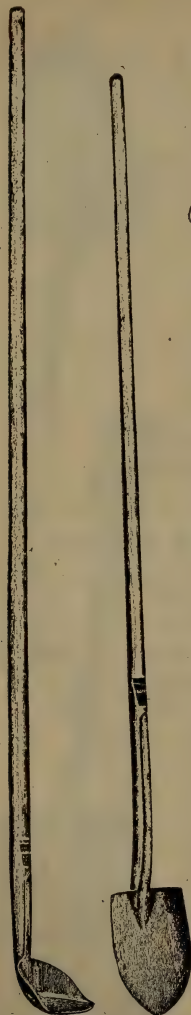
Black, 50 cents less list per dozen.

Half polished, 30 cents less list per dozen.

For Dimensions, See Page *J*

ALL OUR GOODS FULLY WARRANTED.





Telegraph Shovels and Spoons. - Page

"g"



No. 2. - Railroad Tamping Shovels. - Page "a"



Moulders'. - Page "a"



No. 2. Back Strap, D Handle, Spade. - Page "a"

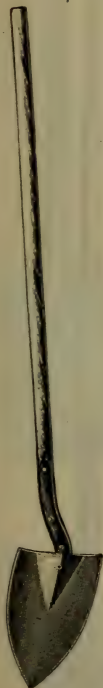


Flat Dra'n Cleaner. - Page "a"



No. 2. - Back Strap, D Handle Round Point. - Page "a"



Back Strap Furnace.—Page *a**26"*

—No. 2—  
Plain Back, Long Handle,  
Round Point.  
Page *a*



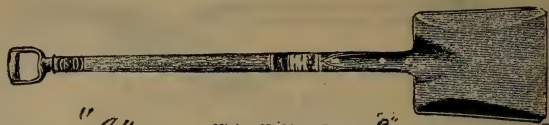
—No. 2—  
Plain Back, Long Handle,  
Spade.  
Page *a*



Back Strap Mining Shovels,  
Half and Full Spring.  
Page *2*



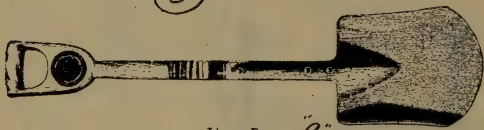
Irrigating,  
with Step.  
Page *a*



"J"

Mining Machine.—Page

"B"



Lime.—Page

"a"

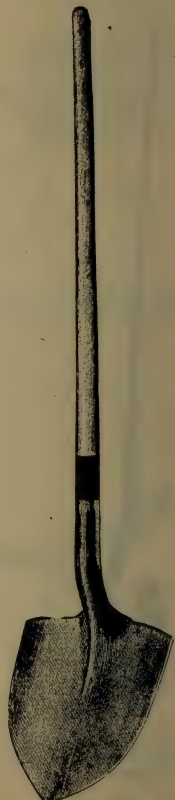


Snow Shovels.—Page "B"



No. 2.—Plain Back, Long Handle, Square Point.—Page

"a"



No. 2.—Hollow Back, Long Handle, Round Point.—Page

"E"



FORKS.



Coke Forks.

No.	25.	8 Times,	15 inches long,	14 inches clear space between Times.	Per dozen,	\$20 00
225.	9	16 $\frac{1}{2}$	14			22 00
25.	10	17	14			24 00
26.	12	18	14			28 00
226.	13	18	14			31 00
0 W	14	19	14			33 00
0.	14	17	1			35 00
00.	16	17	1			40 00
70.	12	14 $\frac{1}{2}$	to			28 00
80.	14	16	to			33 00
90.	16	16	to			40 00

### Coal Forks.

No. 07.	7 Times,	17 inches long.	2½ inches clear space between Times	Per dozen,	\$26 00
" 025.	10 "	15 "	1 " " " " "	"	25 00
" 026.	12 "	16½ "	1 " " " " "	"	29 00

Ore and Stone Forks.

No.	250.	Ore.	8	Tines.	15 inches long,	1 1/4 inches clear space between Tines.	Per dozen,	\$20 00
"	251.	"	10	"	15	"	"	25 00
"	252.	Stone	8	"	14 1/2	"	"	20 00
"	253.	"	10	"	16	"	"	25 00
"	257.	"	10	"	15 1/2	"	"	25 00
"	258.	"	12	"	16	"	"	29 00

Tanners Forks.

No. 27	8	Times, 15 inches long, 1 $\frac{1}{4}$ inches clear space between Times	Per dozen, \$22 00
" 27	10	" 15 " " 1 " " " " " " " "	" 26 00
" 28	12	" 16 $\frac{1}{2}$ " " 1 " " " " " " " "	" 30 00



## PERFORATED METALS.

ALL KINDS OF PERFORATIONS SUITABLE FOR

Cottonseed-Oil Mills, Linseed-Oil Mills, Breweries and Malt Houses, Glucose and Sugar Works, Rice Mills, Corn Screens, General and Special Uses.

We furnish this work in iron, steel, copper, brass, zinc or tin.

It is very difficult to make an intelligent price list on perforated metal, as so many things are to be taken into consideration. We will make estimates on any class of work wanted, asking our customers to give us the following information:

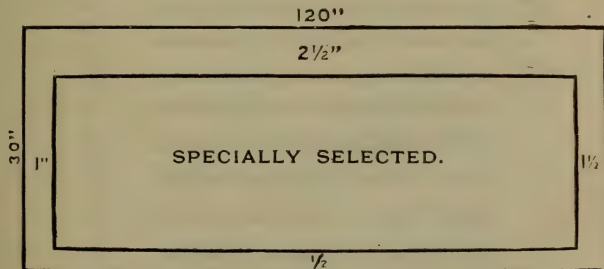
*First.* Kind of metal and size of sheets each way.

*Second.* Size of perforation, round, slot or oval. If slot or oval, which way of the sheet the perforations are to run.

*Third.* Gauge or thickness of metal.

*Fourth.* The width of margins, and if screw holes or nail holes are wanted to fasten to frame. Send diagram as shown below.

*Fifth.* Flat or rolled.



Customers will readily understand that large numbers of sheets of one-sized hole can be perforated cheaper in proportion than small orders. However, we will, whenever possible, bunch orders to save our customers expense in this way. See cuts showing regular standards. Prices on application.

# STEEL-WIRE CLOTH

FOR

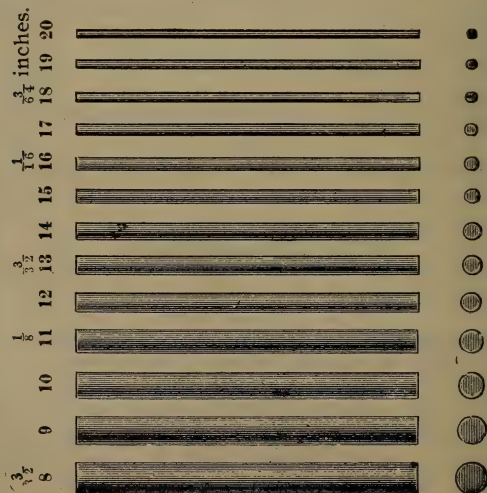
Cottonseed-Oil Mills, Oatmeal Mills, Flour Mills, Linseed-Oil Mills, Rice Mills, Grain Elevators, Breweries.  
Malt Houses, Distilleries, Etc.

USED IN

Screens of all kinds, Bolting Machines, Fanning Mills, Sieves of all kinds, Malt Kilns, Threshing Machines, Etc.

Our cuts show actual sizes of wire and a few of the meshes in general use.

GAUGE.



Actual Size of Wire.

# PRICE LIST STEEL-WIRE CLOTH.

## Plain and Tinned.

Less than 100 lineal feet shall not be considered as a roll.

The mesh in wire cloth is the distance from center to center of wires.

Subject to Discount.

No. 1 MESH.		No. 5/8 MESH.		No. 3 MESH.		No. 4 1/2 MESH.		No. 6 MESH.	
Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.
3	88	10	32	10	60	13	57	23	10
4	73	11	27	11	48	14	45	24	8
5	60	12	22	12	38	15	35	25	7
6	48	13	17	13	32	16	29		
7	38	14	14	14	27	17	24	No. 7 MESH.	
8	32	15	12	15	22	18	19	15	60
9	27	16	10	16	17	19	15	16	48
10	22	17	8	17	14	20	13	17	38
11	17			18	12	21	11	18	32
12	14	No. 2 MESH.		19	10	22	9	19	27
13	12	8	60	20	8	23	7	20	22
14	10	9	48	No. 3 1/2 MESH.				21	17
15	8	10	38	11	60	No. 5 MESH.		22	14
No. 3/4 MESH.		11	32	12	48	13	60	23	12
4	88	12	27	13	38	14	48	24	10
5	73	13	22	14	32	15	38	25	8
6	60	14	17	15	27	16	32	26	7
7	48	15	14	16	22	17	27		
8	38	16	12	17	17	18	22	No. 8 MESH.	
9	32	17	10	18	14	19	17	16	60
10	27	18	8	19	12	20	14	17	48
11	22	No. 2 1/2 MESH.		20	10	21	12	18	38
12	17	9	60	21	8	22	10	19	32
13	14	10	48	No. 4 MESH.		23	8	20	27
14	12	11	38	12	60	24	7	21	22
15	10	12	32	13	48	No. 6 MESH.		22	17
16	8	13	27	14	38	14	60	23	14
No. 5/8 MESH.		14	22	15	32	15	48	24	12
5	88	15	17	16	27	16	38	25	10
6	73	16	14	17	22	17	32	26	8
7	60	17	12	18	17	18	27	27	7
8	48	18	10	19	14	19	22	No. 9 MESH.	
9	38	19	8	20	12	20	17	17	60
				21	10	21	14	18	48
				22	8	22	12	19	38

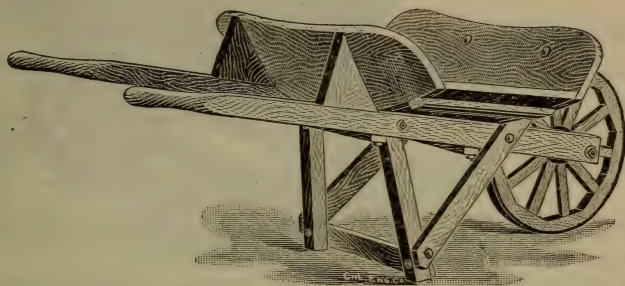
# PRICE LIST STEEL-WIRE CLOTH.

Plain and Tinned. Subject to Discount.

No. 9 MESH.		No. 12 MESH.		No. 18 MESH.		No. 22 MESH.		No. 40 MESH.					
Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.	Wire No.	Cts. per sq. foot.				
20.....	32	28.....	10	23.....	60	30.....	26	34.....	44				
21.....	27	29.....	8	24.....	38	31.....	22	35.....	40				
22.....	22	30.....	7	25.....	32	32.....	19	36.....	36				
23.....	17	No. 14 MESH.		26.....	27	33.....	17	37.....	32				
24.....	14			27.....	22	34.....	15	No. 50 MESH.					
25.....	12			28.....	17	35.....	13						
26.....	10			29.....	15	36.....	12						
27.....	8	21.....	48	30.....	13	No. 24 MESH.		34.....	72				
28.....	7	22.....	38	31.....	12			35.....	59				
No. 10 MESH.		23.....	32	32.....	11			26.....	65	36.....	52		
		24.....	27	33.....	10	27.....	55	37.....	48				
		25.....	22	34.....	9	28.....	46	38.....	44				
		26.....	17	35.....	8	29.....	38	No. 60 MESH.					
18.....	60	27.....	15	36.....	7	30.....	30						
19.....	48	28.....	13	No. 20 MESH.		31.....	26						
20.....	38	29.....	12			32.....	22	36.....	68				
21.....	32	30.....	11			33.....	19	37.....	64				
22.....	27	31.....	10			34.....	17	38.....	60				
23.....	22	32.....	9	24.....	62	35.....	15	39.....	58				
24.....	17	33.....	8	25.....	52	36.....	13	No. 64 MESH.					
25.....	14	34.....	7	26.....	43	37.....75							
26.....	12	No. 16 MESH.		27.....	35	38.....70							
27.....	10			28.....	27	39.....65							
28.....	8			29.....	24	No. 30 MESH.							
29.....	7			30.....	20					28.....	66		
No. 12 MESH.		23.....	38	31.....	17					29.....	56	No. 70 MESH.	
		24.....	32	32.....	15					30.....	47		
		25.....	27	33.....	13	31.....	37						
		26.....	22	34.....	12	32.....	31						
19.....	60	27.....	17	35.....	10	33.....	27	38.....	80				
20.....	48	28.....	15	36.....	8	34.....	23	39.....	75				
21.....	38	29.....	13	No. 22 MESH.		35.....	20	No. 74 MESH.					
22.....	32	30.....	12			36.....	19						
23.....	27	31.....	11			39.....90							
24.....	22	32.....	10			40.....85							
25.....	17	33.....	9	25.....	65	No. 40 MESH.		No. 80 MESH.					
26.....	14	34.....	8	26.....	55					31.....	68		
27.....	12	35.....	7	27.....	46					32.....	57		
				28.....	38					33.....	48		
				29.....	30			41.....	90				



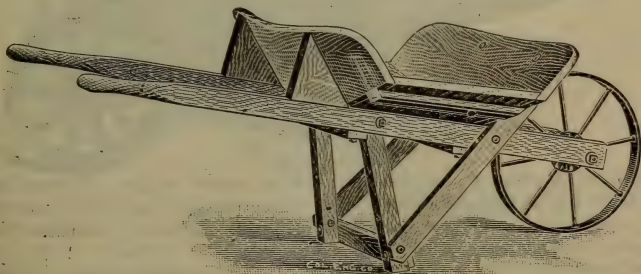
## "SCIOTO" RAILROAD OR CANAL BARROW



Full Sized Bent Tray, well planed, cleated, braced and bolted, as shown in cut. Legs and cross pieces gained, leg braces extending beyond the handles, forming braces for the tray, and bolted to it.

Diameter of wheel, 17 inches; tire,  $\frac{3}{16}$  x  $1\frac{1}{8}$  inches; spokes,  $\frac{7}{8}$  x 1 inch;  $\frac{1}{2}$  inch axle bolt. Unpainted.

Knocks down completely for shipping, and is easily set up. Weight per dozen, 576 pounds.



Same as above, except furnished with No. 13-X Lewis Patent Steel Spoke Wheel. Diameter of wheel,  $16\frac{1}{2}$  inches; spokes,  $\frac{3}{8}$  inch round; tire,  $1\frac{3}{8}$  x  $\frac{3}{8}$  inch;  $\frac{1}{2}$  inch axle bolt. Painted black. Weight per dozen, 594.

# WHARF OR OYSTER BARROW



The best Wharf or Phosphate Barrow made. Also suited for ashes, coal or stone. All hardwood. Handles 5 feet long.

Sides and end pieces of tray *dovetailed together*, iron strapped and firmly nailed. Thoroughly braced and bolted. Tray iron strapped on top.

Size of tray : 12 inches deep at handles and 16 inches at wheel ; bottom, 17 inches wide by 18 inches long ; top, 32 inches wide by 33 inches long. Wheel, 17 inches in diameter ; tire,  $1\frac{1}{2} \times 1\frac{3}{8}$  inches ; spokes, 1 x 1 inch. Axle bolt,  $\frac{1}{2}$  inch.

Painted brown ; wheel, lead color. Weight, 63 pounds.

Price, per dozen. wood wheel, \$ . . . . . ; steel wheel, \$ . . . . .



Similar to our Wharf Barrow, with Bowl of much greater capacity. Selected hardwood, with sides and end pieces *dovetailed together*, iron strapped and firmly nailed. Tray iron strapped on top. All other parts thoroughly braced and bolted. Also suited for bones and use in fertilizer factories. A good Sawdust Barrow.

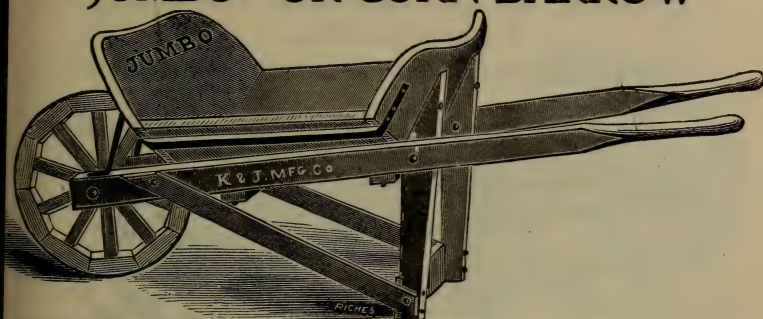
Size of tray : 16 inches deep at handles and 26 inches at wheel ; bottom, 17 inches wide by 18 $\frac{1}{2}$  inches long ; top, 41 inches wide by 43 inches long. Wheel, 17 inches in diameter ; tire,  $1\frac{1}{2} \times 1\frac{3}{8}$  inches ; spokes, 1 x 1 inch. Axle bolt,  $\frac{1}{2}$  inch.

Painted brown ; wheel, lead color. Weight, 80 pounds.

Either Wharf or Malt Barrow furnished, when so ordered, with No. 13-X Lewis Patent Steel Wheel, 16 $\frac{1}{2}$  inches diameter ; tire,  $1\frac{3}{8} \times \frac{3}{8}$  inches.

Price, per dozen, wood wheel, \$ . . . . . ; steel wheel, \$ . . . . .

## "JUMBO" OR CORN BARROW



For Corn, Coal, Sawdust, Manure, Ashes, etc.

Bent elm tray,  $11\frac{1}{2}$  inches deep at handles and  $14\frac{1}{2}$  inches at wheel by 42 inches wide by 32 inches long on top. Wheel, 17 inches diameter; tire,  $1\frac{1}{2} \times \frac{3}{8}$  inches; spokes, 1 x 1 inch. Axle bolt,  $\frac{1}{2}$  inch.

Weight, 60 pounds. Capacity, 9 cubic feet.

Furnished with No. 13-X Lewis Patent Steel Spoke Wheel, when so ordered,  $16\frac{1}{2}$  inches diameter; tire,  $1\frac{1}{2} \times \frac{3}{8}$ .

Price, per dozen, wood wheel, \$.

Price, per dozen, steel wheel, \$.....

## STAVE OR BARK BARROW



For Staves, Bark, Bales, Boxes, etc. A serviceable Barrow for use at boat landings and depots. Strongly made of hardwood. Body and dash strapped with heavy iron. Well finished, painted dark red and varnished. Weight, 65 pounds.

Handles, 55 inches long. Bottom, 24 inches wide at handles and 21 at dash. Dash, 14 inches wide at top and 17 at foot by 30 inches long. Wheel, 21 inches diameter; tire,  $1\frac{1}{2} \times \frac{3}{8}$  inches; spokes, 1 x  $1\frac{1}{2}$  inches. Axle bolt,  $\frac{5}{8}$  inch.

Folds for shipping same as Garden Barrow. Price per dozen ..... \$.....

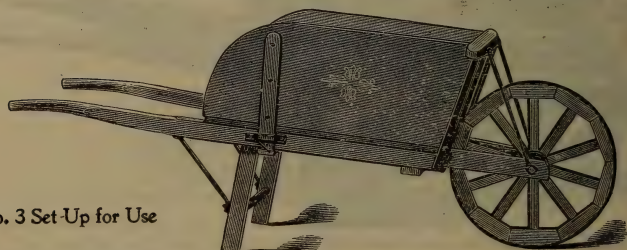
Furnished with No. 15-X Lewis Patent Steel Wheel, when ordered, 19 inches diameter; tire,  $1\frac{1}{2} \times \frac{3}{8}$  inches.



# Folding Garden or Farm Barrow

With Jacobs' Patent Wheel

REMOVABLE SIDEBOARDS—DOUBLE FRAMES



No. 3 Set-Up for Use

These Barrows are made of thoroughly seasoned wood, with DOUBLE FRAMES, firmly bolted together, iron braced, and so constructed that, by simply removing one bolt (the axle) and two nuts, they can be folded flat down (see cut), and shipped at lowest rate of freight. But a moment's time is required to set up for use.

No. 2, with No. 2 Wood Wheel 16½ inches diameter; tire, 1½x3-16 inches; spokes, 7⁄8x1 inch.

No. 3, with No. 3 Wood Wheel 19 inches diameter; tire, 1½x3-16 inches; spokes, 1x1 inch.

No. 4, with No. 4 Wood Wheel 21 inches diameter; tire, 1½x3-16 inches; spokes, 1x1¼ inch.

No. 5, with No. 4 Wood Wheel 21 inches diameter; tire, 1½x3-16 inches; spokes, 1x1¼ inch.

Axle bolts on Nos. 2 and 3 are ½ inch; Nos. 4 and 5, ¾ inch.

No. 2 is small size No. 3 medium, No. 4 large, and No. 5 extra large.

No.	Dimensions of Bed	Capacity	Length of Handle	Weight	Price, Doz.
2	11 x 20 x 25 inches	3 cubic feet	48 inches	45 lbs.	\$ . . . . .
3	12 x 22 x 25 inches	4 cubic feet	52 inches	52 lbs.	. . . . .
4	14 x 24 x 28 inches	6 cubic feet	54 inches	59 lbs.	. . . . .
5	21 x 26 x 31 inches	9 cubic feet	54 inches	80 lbs.	. . . . .

PAINTED GREEN AND VARNISHED. Painted Red or Blue when so ordered. These Barrows are also furnished painted one COAT OF METALLIC BROWN, for Export Trade, at reduced prices.

With Lewis Patent  
Steel-Spoke Wheel

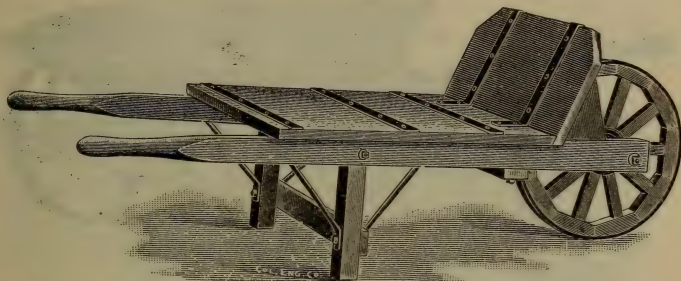


Nos. 2 and 3.—No. 13-X Wheel, 16½ inches diameter; tire, 1½x¾ inches.

Nos. 4 and 5.—No. 15-X Wheel, 19 inches diameter; tire, 1½x¾ inches.



## STRAIGHT HANDLE STONE BARROW



For Stone or Pig Metal.

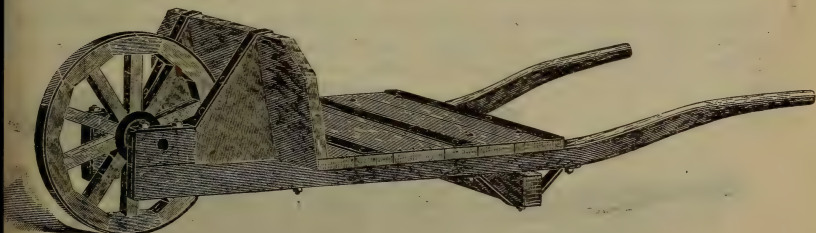
This is a strong, well-made Barrow, iron strapped over the bottom, and well bolted together. The iron straps are put on crosswise, as in cut.

Handles, 6 feet long. Legs, 12 inches long. Bottom,  $1\frac{1}{4}$  inches thick by 23 inches wide by 27 inches long. Dash, 10 inches high.

Wheel, 17 inches diameter; tire,  $1\frac{3}{4} \times \frac{3}{8}$  inches; spokes,  $1 \times 1\frac{1}{4}$  inches. Axle bolt,  $\frac{5}{8}$  inch. Painted dark red. Wheel, lead color. Weight, 64 pounds.

Price. per dozen, wood wheel, \$ . . . . . ; steel wheel, \$ . . . . .

## BENT HANDLE STONE BARROW



Bent handles. Thoroughly bolted. Well ironed. We guarantee it to give satisfaction.

Handles, 6 feet long. Cross piece at legs,  $2 \times 3$  inches. Bottom,  $1\frac{1}{4}$  inches thick by 26 inches wide by 27 inches long. Dash, 11 inches high. Wheel, 17 inches diameter; tire,  $1\frac{3}{4} \times \frac{3}{8}$  inches; spokes,  $1 \times 1\frac{1}{4}$  inches. Axle bolt,  $\frac{5}{8}$  inch.

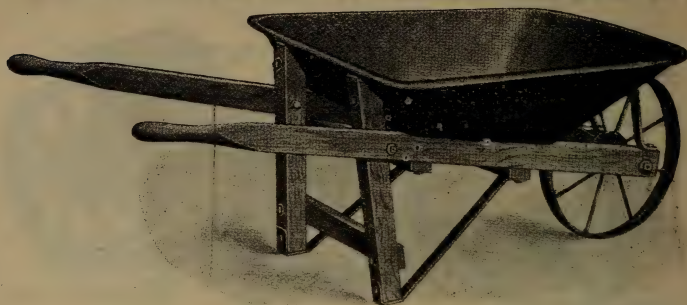
Painted dark red. Wheel, lead color. Weight, 72 lbs.

Either of the above Barrows furnished with No 15 Lewis Patent Steel Spoke Wheel, when so ordered,  $16\frac{1}{2}$  inches diameter; tire,  $1\frac{3}{4} \times \frac{3}{8}$  inches.

Price. per dozen, wood wheel, \$ . . . . . ; steel wheel, \$ . . . . .

Stone Barrows are always shipped set up complete. *except wheels off.*

# STEEL TRAY WHEELBARROWS



No. 2. For Coal, Manure, Cinders, Ashes, etc.

No	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Length	Greatest Height	Capacity	Weight
1	32 in.	29 in.	7 in.	5 in.	65 in.	19 in.	3 cubic ft.	57½ lbs.
2	35½ in.	28½ in.	8½ in.	6 in.	65 in.	20½ in.	4 cubic ft.	59 lbs.
3	41½ in.	33 in.	11½ in.	8 in.	65 in.	24 in.	6 cubic ft.	66 lbs.

ALL TRAYS NO. 15 STEEL.

The flange of tray is turned over a  $\frac{1}{8}$  steel rod, which passes entirely around tray, giving a smooth finish to the edge of bowl, preventing breaking, and stiffening and strengthening it.

No. 13-X Lewis Patent Round Spoke Steel Wheel, 16½ inches diameter; tire, 1½ x ¾ inches. Tray and wheel painted black; frame, brown.



No. 3 Coal or Coke Barrow Weight, 65 pounds.

Capacity, 400 to 450 pounds coal, or 5 bushels coke or charcoal, or 6 cubic feet earth.

# The Pan-American Steel Tray Barrow

STEEL VS. WOOD—"THE WOOD TRAY MUST GO!"



**Best Barrow on the Market for Street Pavers. Unequaled for Strength and Durability.**

THE TRAY of No. 14 Best Steel, PRESSED FROM A SINGLE SHEET, without joint, seam or rivet. Stronger and more durable than riveted iron trays of same thickness. The flange of tray is turned over a  $\frac{3}{8}$  steel rod, which passes entirely around the tray, giving a smooth finish to the edge of the bowl, preventing breaking, and stiffening and strengthening it.

Size of tray: Greatest length, 32 inches; greatest width, 33 inches; depth at wheel end, 11 inches; depth at handle end,  $7\frac{1}{2}$  inches.

The Wheels are so constructed, having the spokes tightened from the center, that it is impossible for tires to come off or spokes to be loosened. These wheels revolve on a fixed shaft or axle bolt, similar to a buggy wheel, and run true and evenly, and the axle shaft serves as a brace to the handles. Wood Wheels, 17 inches diameter; tire,  $1\frac{1}{8} \times \frac{3}{8}$  inches.

No. 13-X Lewis Steel Wheel, 16 inches diameter; tire,  $1\frac{3}{8} \times \frac{3}{8}$  inches; steel spokes,  $\frac{3}{8}$  inch round





## TUBULAR STEEL WHEELBARROWS WITH WHEEL GUARD



The No. 14 Lewis Steel Wheels used with these Barrows are  $16\frac{1}{2}$  inches in diameter, with iron tire  $1\frac{1}{2} \times \frac{3}{8}$  inches, and steel spokes  $\frac{1}{2}$  inch round, malleable hub,  $\frac{1}{2}$  inch axle bolt.

No.	Gauge of Steel in Tray	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Height	Cubic Capacity	Weight	Price, Each
4	15	32 in.	29 in.	7 in.	5 in.	$19\frac{1}{2}$ in.	3 ft.	70 lbs.	\$10.75
$4\frac{1}{2}$	14	32 in.	29 in.	7 in.	5 in.	$19\frac{1}{2}$ in.	3 ft.	75 lbs.	11.50
5	14	$35\frac{1}{2}$ in.	$28\frac{1}{2}$ in.	$8\frac{1}{2}$ in.	6 in.	$21\frac{1}{2}$ in.	4 ft.	78 lbs.	13.50

Greatest Length of all Barrows  $67\frac{1}{2}$  inches. Greatest Width of all Barrows is width on Top of Tray. **WITHOUT WHEEL GUARD**



These Barrows are intended for moving earth, sand, gravel, mortar, etc. For the heaviest work in mines, quarries, etc., we recommend our Tubular Mining or General Purpose Steel Barrows, shown on another page.



## TUBULAR STEEL WHEELBARROWS

### WITH WHEEL GUARD



The No. 15 Lewis Steel Wheels used with these Barrows are 16½ inches in diameter, with iron tire 1¼ x ¾ inches, and steel spokes ½ inch round, and extra heavy malleable hubs. ½ inch Axle Bolts. The legs and leg braces are extra heavy.

No.	Gauge of Steel in Tray	Length on Top	Width on Top	Depth at Wheel	Depth at Handle	Greatest Height	Cubic Capacity	Weight	Price Each
7	14	35½ in.	28½ in.	8½ in.	6 in.	21½ in.	4 ft.	88 lbs.	\$14 25
10	13	41½ in.	33 in.	11½ in.	8 in.	25½ in.	6 ft.	109 lbs.	20 00
12	15	41½ in.	33 in.	11½ in.	8 in.	25½ in.	6 ft.	93 lbs.	18 50

Greatest length of all Barrows, 67½ inches.

Greatest width of all Barrows is width on Top of Tray.

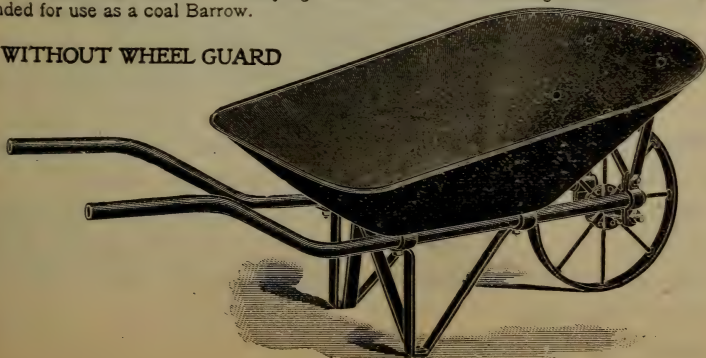
No. 7 Barrow, capacity, 215 to 250 pounds of coal.

No. 10 Barrow, capacity, 400 to 450 pounds of coal.

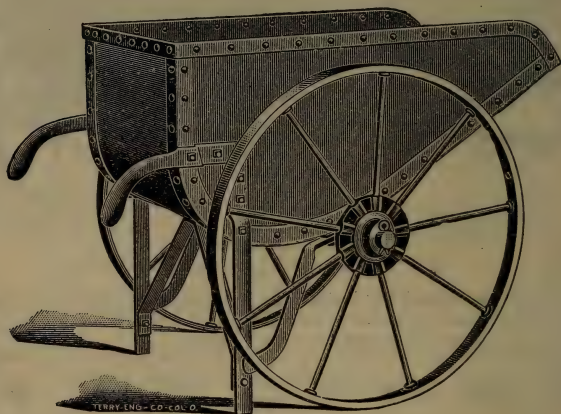
No. 12 Barrow, capacity, 5 bushels coke or charcoal.

No. 12 Barrow is intended for carrying coke, charcoal, or other light material, and is not intended for use as a coal Barrow.

### WITHOUT WHEEL GUARD



## STEEL CHARGING BARROW.



No. 2.—LIGHT PATTERN.

This Barrow is designed to meet the demand for a lighter and cheaper Charging Barrow than our No. 0 or No. 1, and especially for **Blast Furnaces**.

**Box:** 45 inches long x 26 inches wide x 20 inches deep, of No. 12 Steel. Steel Angles at corners  $1\frac{3}{4} \times 1\frac{3}{4} \times \frac{1}{4}$  inches, firmly riveted to plates. Bottom reinforced with plate 12 x 26 inches of No. 12 Steel. Top Band Steel  $1\frac{1}{2} \times \frac{3}{8}$  inches.

**Wheels:** 34 inches diameter; Tire  $2 \times \frac{3}{4}$  inches; 9 Spokes,  $\frac{3}{4}$  inches round. Cast Iron Hubs. Fastened on Axle by Washer and Cotter.

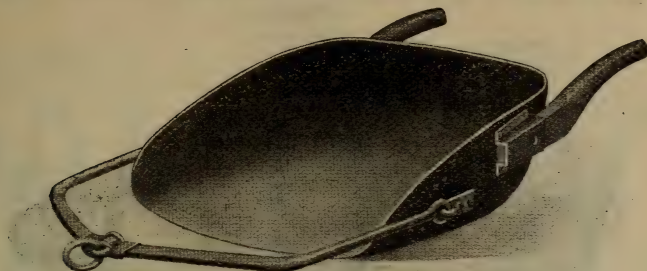
**Legs:** Steel  $1\frac{3}{4} \times \frac{5}{8}$  inches with Cross and Lateral Braces,  $1\frac{3}{4} \times \frac{3}{8}$  and  $1\frac{1}{2} \times \frac{1}{2}$  inches.

Steel Axle,  $1\frac{1}{2}$  inches square—38 inches long over all.

Painted Steel Color.

Weight 385 lbs. Price, \$36.00.

# THE "BOSS" SOLID STEEL DRAG SCRAPER

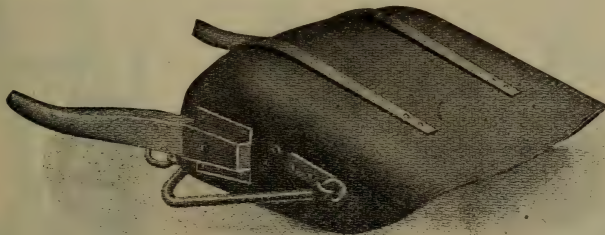


**Nos. 1 and 2 Scraper Without Runners**

(Patented November 4, 1879, and March 24, 1885)

## BEST AND CHEAPEST SCRAPER IN THE MARKET

These Scrapers are made from heavy plates, of specially hardened steel, and are stamped from one sheet without joint, seam or rivet. They are superior to any other Drag Scraper upon the market, the "Columbus" Solid Steel Scraper alone excepted. The bowl being made of thicker and harder steel, enables it to scour where no other Scraper will; and owing to the sharp, rounded nose, it will enter the ground more readily than any other make of Scraper. THE BAILS are STEEL, with perfect working swivels, and handles of hardwood. We guarantee this Scraper in every particular. Made in three sizes.



**Nos. 1 and 2 Scraper with Runners**

No. 1.	Capacity, 7 cubic feet; weight, 90 pounds; each	\$.....
No. 2.	Capacity, 5 cubic feet; weight, 80 pounds; each	.....
	With Steel Runners, extra weight, 8 pounds; each extra	.....
	With Steel Bottom Plate, extra weight, 15 pounds; each extra	.....

## TRUCKS.

Store and  
Warehouse  
Trucks.

New York Pattern.

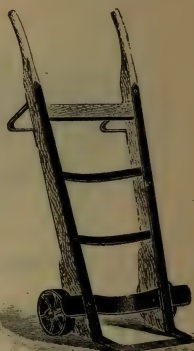
No. 2, Half Strapped.  
Steel Nose and Axle.Barrel Trucks.  
Western Pattern

Full Ironed.

Steel Nose, Cross-Bars and Axle.

One Wood and Three Curved Steel Cross-Bars.  
Made with all four Cross-Bars Curved Steel at \$1.00 advance  
in list price.

No.	Len. of Handle, ft.	Width, in.	Diameter of Wheel, in.	Weight, lbs.	Price
1	3	11	19	6½	55 \$ 9 00
2	4	2	20	7½	75 11 00
3	4	6	22	8½	90 16 00
4	5	0	24	10½	117 21 00

Barrel Trucks.  
New York Pattern.

Steel Nose, Side Straps and Cross-Bars. Steel Axle.

No.	Length of Handle, ft.	Width at Nose, in.	Width at Upper Bar, in.	Diameter of Wheel, in.	Weight, lbs.	Half Strapped	Full Strapped
1	4	0	13	16	8	36 \$4 85	\$6 50
2	4	5	14½	19½	6½	54 6 00	8 00
3	4	7	15½	21½	7½	66 7 00	9 00
4	4	11	16	21½	8½	80 8 00	10 00
5	5	4	17½	22½	10½	100 9 50	11 50
6	5	8	18½	24½	10½	120 11 50	13 50

No.	Length of Handle, ft.	Width at Nose, in.	Width at Upper Bar, in.	Wheel Dia.	Tread	Weight	Price
1	4	0	13	16	8	1½	50 \$7 00
2	4	5	14½	19½	6½	2	85 9 50
3	4	7	15½	21½	7½	2½	92 10 00
4	4	11	16	21½	8½	3	100 12 00
5	5	4	17½	22½	10½	3½	120 13 00

Warehouse and Store Trucks.



Western Pattern—Half Ironed.

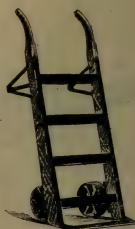
Axles Turned and Wheels Bored.

No.	Length of Handle, ft.	Width, in.	Dim. of Wheel, in.	Wgt. pounds	Price
0	3	6	18	6½	42 \$6 00
1	3	11	19	6½	44 7 00
2	4	2	21	7½	55 9 00
3	4	6	22	8½	74 13 00



COLUMBUS.

"COLUMBUS" TRUCK.—Length of Handle 46 inches; width at nose, 12 inches; width at upper cross-bar, 17½ inches; axle, ¾ inch square; weight, 34 lbs. Price, each...\$6 00



Western Pattern—Full Ironed.

Axles Turned and Wheels Bored.

No.	Length of Handle, ft.	Width, in.	Dim. of Wheel, in.	Wgt. pounds	Price
0	3	6	19	6½	49 \$7 00
1	3	11	19	6½	50 8 00
2	4	4	20	7½	66 10 50
3	4	8	22	8½	87 15 00



## TRUCKS.

## Bag Trucks.

With Steam-Bent Handles.



No. 3.

Heavy Cast Iron Nose.

- No. 1. Length of handle, 42 inches; width at nose, 11½ inches; width at upper bar, 16½ inches; axle, ¾ inch square; wheel, 6x1½ inches; weight, 29 lbs. Price...\$5 00
- No. 3. Length of handle, 48 inches; width at nose, 15 inches; width at upper bar, 20½ inches; axle, 1 inch square; wheel, 6½x2 inches; weight, 68 lbs. Price...\$9 00

## Hotel Trucks.

With Rubber Banded Wheels.



Bent Handle Hotel.

Axles Turned and Wheels Bored.  
Steel Nose and Steel Axle.

No.	How Ironed	Len. of Handle, ft.	Width, in.	Diam. of Wheel, inches	Weight lbs.	Price
1	Half	3	8	18	6	\$10 00
1	Full	3	8	18	6	46
2	Half	4	8	20	8½	61
2	Full	4	8	20	8½	68

## Cheese Trucks.



Cheese Truck.

Steel Nose, Straps, Cross-Bars and Axle.

Handles, 4 feet 6 inches long. Width of frame, 18 inches. Four curved steel cross-bars, with center strap riveted to each. Wheels, 7½ inches diameter. Weight, 55 lbs. Price.....\$12 00

## Railroad and Packing House.

## The "N. C." Freight Truck.

## Wheat or Grain Trucks.

The "Golden Gate" Pattern.



Western Pattern Trucks—R. R. Full Ironed.

Extra Heavy. Handle and Cross Straps bolted through Handles, Axles turned and Wheels bored.

No. 4. Length of Handle, 5 feet; width, 24 inches; diameter of wheel, 16½ inches; weight, 120 lbs. Price.....\$20 00

No. 6. Length of Handle, 5½ feet; width, 28 inches; diameter of wheel, 12 inches; weight, 150 lbs. Price.....\$24 00



We call particular attention to the above Truck & being especially adapted in design and construction for handling freight. It is thoroughly well made of selected materials, and will stand hard usage. Adopted as a Standard Truck by many Transportation Companies.

The handles are made of best oak, ash or hickory. Length of Handles, 4 feet 8½ inches; width at upper bar, 20 inches; width at nose, 16 inches; length of nose, 4½ inches, extra wide [5x1½ inch] curved steel cross-bars extending as guard over wheels and bolted through dash, handles wood-bolster and axle; two upper curved cross-bars of 1½x½ inch steel, and bolted through straps and handles. Wheels, 9½ inch diameter, 2½ inch face, steel axle, 1½ inch square; steel legs and braces, 1½x½ inches. Weight, 185 lbs. Price.....\$20 00



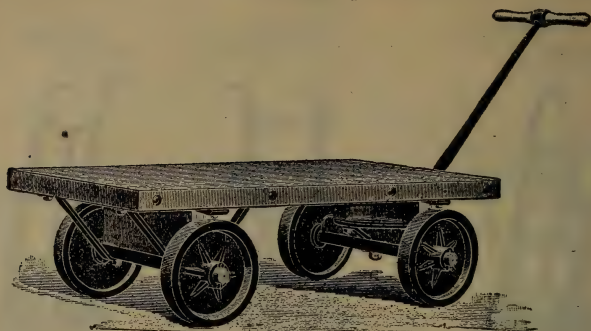
This Truck Weighs Exactly 75 Pounds.

No. 3. Length of handle, 4 feet 8 inches; width at nose, 15 inches; with at upper bar, 10 inches; wheels, 10 inches in diameter, 2½-inch face; axle, 1½-inch square; spindle turned; wheels bored.

These Trucks are made of selected lumber; iron work is hand forged; put together substantially with bolts; extra long nose-iron for grain sacks. They have been adopted and used by the largest grain dealers on the Coast.

Price.....\$16 00

## MACHINE SHOP WAGON.



Capacity, four to five tons. This truck is especially adapted for machine and railroad shops, foundries, factories, etc. Constructed to meet the wants of the users.  
Prices on application.

## THE "IMPROVED STAR" TRUCK.

NO TRUCK OF ITS KIND CAN EQUAL IT.



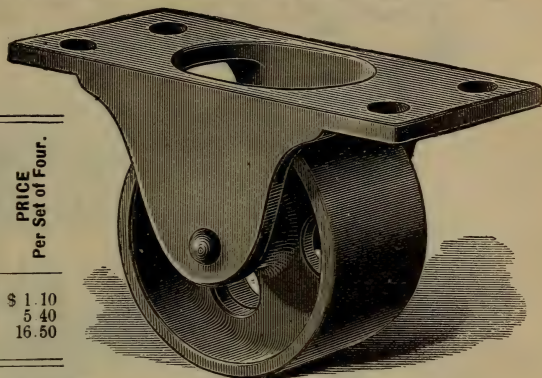
It will handle with the same facility Large and Small Boxes, Kegs or Barrels of any size, and by slipping hook around out of the way can be used for a Bag Truck.

The hook slides on the handle, and is readily adjustable. Handle is of oak; nose plate, axle and hook of steel; wheels  $3\frac{1}{4}$  inch diameter; and truck is very strongly built.

It is just the thing for general use in a store. Send a sample order and see for yourself.

## CHEST ROLLERS AND RIGID TRUCK CASTERS.

Number.	Diameter of Wheel, Inches.	Width of Wheel, Inches.	Size of Plate, Inches.	Height from Floor, Inches.	PRICE Per Set of Four.
3	2½	1¼	4¼ x 17½	2¼	\$ 1.10
5	4½	1½	6¼ x 2¼	5	5 40
8	7¾	2	9¼ x 6	9	16.50



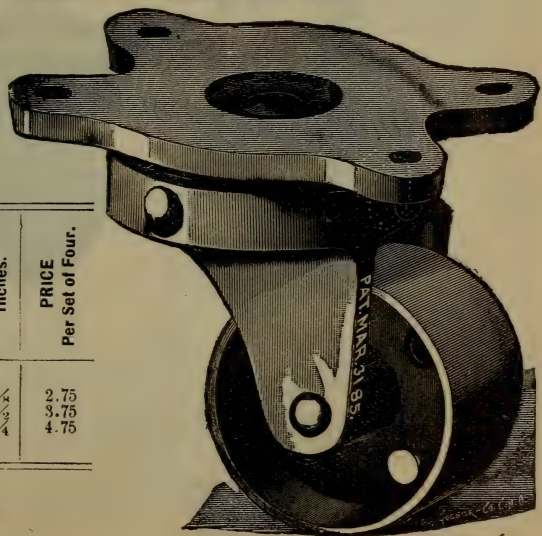
No. 3 Packed one Set in a Box, Japanned.  
Nos. 5 and 8 Packed in Bulk, not Japanned.

Three Sizes.

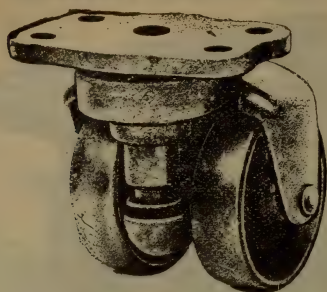
## "SAMSON" TRUCK CASTER.

FOR FACTORIES, STORES,  
AND ANYWHERE IN CON-  
STANT AND HARD USE.

Number.	Diameter of Wheel, Inches.	Size of Plate, Inches.	Height from Floor, Inches.	PRICE Per Set of Four.
485	2½	3¼ x 4½	3¼	2.75
490	3½	3¾ x 5	4½	3.75
495	4	5½ x 5¼	5¼	4.75



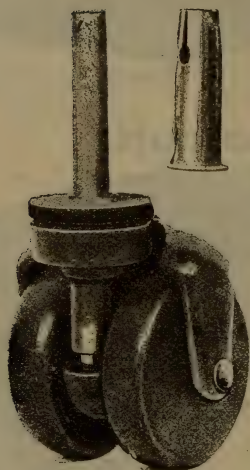
Packed in Bulk.



No. 4 A

Oblong Plate,  $1\frac{1}{2} \times 2\frac{1}{8}$  inches.

The upper bearing on the stem consists of a rolling box containing steel anti-friction rolls, and they are so arranged that the wear is evenly distributed. Absolutely noiseless.



No. 4 E.

Steel Stem,  $\frac{1}{8} \times 1\frac{1}{2}$  inches.  
Plate, 1 inch.



No. 4 F.

Cast Iron Stem,  $\frac{1}{2} \times 2\frac{1}{8}$  inches.  
Plate,  $1\frac{1}{4}$  inch.

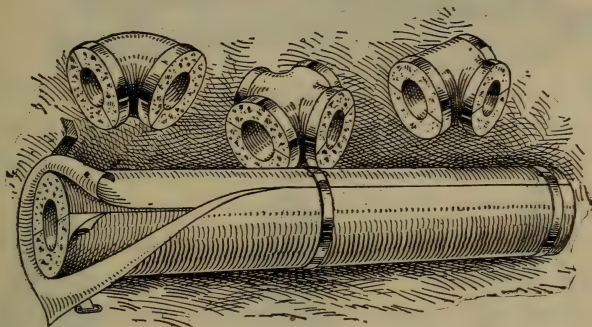
Above shown casters are finished in bronze and can be furnished with nickel plated wheels or lignum-vitae wheels.

We make Casters in 18 different styles and sizes, for all purposes.

Catalogue cheerfully mailed on application.



## ASBESTOS MAGNESIA SEC. AND PLASTIC COVERINGS.



### For Steam Pipes and Boilers.

This Covering is composed of Asbestos, Magnesia and other absolutely fire-proof, non-conducting materials. Is moulded into form. Has as an outer shell a heavy woolen felt jacket, which adds to its efficiency and durability. This combination makes it the most efficient and durable high pressure steam pipe covering ever produced.

It is made in sections 3 feet long, to fit any regular size pipe, from  $\frac{1}{2}$  inch to 12 inches in diameter.

Canvas Jacket and brass lacquered Bands to hold it in position. Sections are cut lengthwise through the center so they can be applied by any ordinary workman.

Coverings for Regular Ells, Tees, 45° Ells, Globe Valves and Crosses are also moulded of this same material.

#### Price List.

Inside Diameter of Pipe.	Price Lineal Foot.	Ells each.	Tees, each.	Valves, each.	Crosses, each.
$\frac{1}{2}$ inch.....	\$0.22	\$0.24	\$0.36	\$0.36	\$0.45
$\frac{3}{4}$ ".....	.24	.30	.39	.39	.51
1 ".....	.27	.30	.39	.39	.51
1 $\frac{1}{4}$ ".....	.30	.30	.39	.39	.51
1 $\frac{1}{2}$ ".....	.33	.30	.39	.39	.51
2 ".....	.36	.33	.44	.44	.57
2 $\frac{1}{2}$ ".....	.41	.38	.49	.49	.63
3 ".....	.45	.44	.57	.57	.72
3 $\frac{1}{2}$ ".....	.51	.48	.63	.63	.81
4 ".....	.57	.52	.70	.70	.90
4 $\frac{1}{2}$ ".....	.63	.60	.78	.78	.96
5 ".....	.69	.69	.90	.90	1.08
6 ".....	.75	.78	1.08	1.08	1.20
7 ".....	.82	.99	1.44	1.44	1.32
8 ".....	.90	1.20	1.62	1.62	1.44
9 ".....	.98	1.32	1.80	1.80	1.62
10 ".....	1.14	1.50	2.10	2.10	1.80
12 ".....	1.50	.....	.....	.....	.....

Prices on Plastic covering furnished upon application.

Liberal Discount to Dealers and Large Consumers.

## THE GEM FLUE CLEANER.



**W**E manufacture all sizes, from  $1\frac{3}{4}$  to 6 inches. The Gem being strictly automatic, it readily passes over welds, and it is made light, so that it is a pleasure to handle it.

We supply you at about one-half the price of any other cleaner.

In ordering give the outside diameter of the Tubes. Ask for discounts.

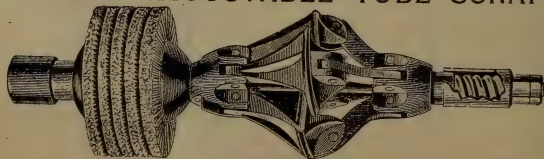
**LIST PRICE, \$1.00 PER INCH.**

### STEAM FLUE CLEANER.



No. Cleaner	Size of Tubes, Outside Diameter	Price, with Clamps and Nipple,	Best 4-Ply Steam Hose, Per Foot
1	3 to $2\frac{1}{2}$	7.00	$\frac{3}{4}$ .67
2	3 to $3\frac{1}{2}$	9.00	1 .83
3	4 to $4\frac{1}{2}$	10.00	$1\frac{1}{4}$ 1.04

### INGALLS ADJUSTABLE TUBE SCRAPER.



#### PRICE LIST.

Size.....Inches	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Plain.....Each	2.00	2.25	2.50	2.75	3.00	3.25	3.50	4.00	4.50	5.00	6.00
With Brush....."	2.50	2.85	3.15	3.45	3.75	4.05	4.40	5.00	5.65	6.25	7.50
Extra Brushes....."	.50	.60	.65	.70	.75	.80	.90	1.00	1.15	1.25	1.50

## COMBINATION FLUE CLEANER.



The original combination of this nature, and still remains the best. Price, 2 to 4 inches. \$1.25 per " Without Brush Price, 2 to 4 inches. \$1 per inch.



Elliptic Spring Steel and Adjustable Tube Scraper.

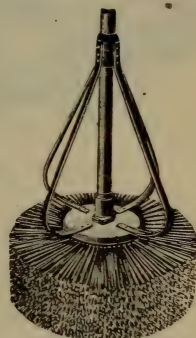
1 to 2 in. \$2.00; over 2 in. \$1.00 per in.; over 4½ in. \$1.25 per inch.



Christoffel Coil Brush and Flexible Scraper Combined

1 to 1¾	2	2¼	2½	2¾
\$1.00	1.10	1.20	1.30	1.40
3	3¼	3½	3¾	4
\$1.50	1.65	1.75	1.90	2.00

Over 4 in. 75c per inch.

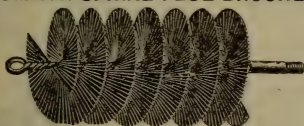


Steel Wire Boiler Flue Brush with Guards.

8 to 24 inches.

Per inch. ....40c

## COMMON SPIRAL FLUE BRUSHES.



Price, Black, 1, 1¼, 1½, 1¾, and 2 Inches... Each 1.00  
Other sizes larger, to 6 Inches.... Per Inch .50

Same of Bright Tinned Iron and Steel Wire, soldered throughout.

Price, 1, 1¼, 1½, 1¾, and 2 Inches. .... Each 1.20  
Above 2 Inches. .... Per Inch .60

## THE RUGGLES FLUE CLEANER



Flue Cleaners, 1¼ to 3 inches diameter	\$5.00
" " 3¼ inches.....	6.00
" " 4 inches.....	7.00
" " 4½ in. to 5 in. inclusive.....	10.00

Wire Cable Handle with Fittings, up to 18 ft 3.50

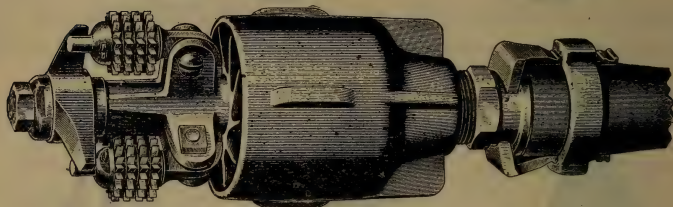
Flexible Links for Stiff Rods..... 1.50

Knives for Smoke Flue Cleaner, per set..... 2.00

## The Niagara Tube Cleaner.

A SAVER OF TIME, LABOR, FUEL AND BOILER COMPOUND.

### MODEL A.



Patented : Oct. 24th, 1893 ; Sept. 25th, 1894 ; June 2d, 1896 ; May 15th, 1900.

### PRICE LIST

With hose couplings, without hose.

2, 2½ and 3-inch, with one extra head, and five extra sets of cutters and arms . . . . .	\$65.00
2, 2½ and 3-inch, with only one extra set of cutters and arms . . . . .	45.00
3½, 4 and 4½-inch, with one extra head, and five extra sets of cutters and arms . . . . .	75.00
3½, 4 and 4½-inch, with only one extra set of cutters and arms . . . . .	50.00

### PRICE EXTRA PARTS.

Cutters and Arms . . . . .	\$ 1 00 per set
Cutter Wheels . . . . .	.05 each.
Cutter Arms . . . . .	.10 each.
50 ft. 1-in. four-ply wire-bound Steam Hose . . . . .	25 00
50 ft. 1½-in. four-ply wire-bound Steam Hose . . . . .	35 00

The NIAGARA is used in connection with Babcock & Wilcox, Heine Sterling Standard, Root, Wood, Hyde, and in fact mostly every type of water-tube boilers.

When ordering extra parts give the factory number of your Cleaner.





# Gardner Governors

for

## Stationary and Portable Engines.



Made with Speeder, Automatic Safety Stop and Sawyer's Lever.

Figure --- shows Standard Class "A" pattern, made in sizes from  $\frac{1}{4}$  in. to 16 in. inclusive. It has the Automatic Safety Stop.

Figure --- shows Standard Class "B" pattern, made in sizes from  $\frac{3}{4}$  in. to 10 in. inclusive. It has Speeder and Sawyer's Lever, but not the automatic stop.

PRICE LIST OF CLASS "A" AND "B."

Size of Governor— Diameter of Opening.	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10
Price Class B, Plain . . .	\$14 00	\$16 00	\$18 00	\$21 00	\$25 00	\$30 00	\$35 00	\$40 00	\$45 00	\$50 00	\$55 00	\$60 00	\$65 00	\$70 00	\$75 00	\$80 00	\$85 00	\$90 00
Price Class B, Finished . .	16 00	18 00	20 00	24 00	29 00	34 00	40 00	45 00	50 00	55 00	60 00	65 00	70 00	75 00	80 00	85 00	90 00	95 00
Price Class A, Plain . . .	18 00	21 00	24 00	29 00	34 00	40 00	45 00	50 00	55 00	60 00	65 00	70 00	75 00	80 00	85 00	90 00	95 00	100 00
Price Class A, Finished . .	23 00	27 00	31 00	37 00	44 00	50 00	57 00	63 00	70 00	77 00	83 00	90 00	97 00	104 00	110 00	117 00	124 00	130 00

TABLE OF DIMENSIONS OF CLASS "A" AND "B" GOVERNORS

Size of Governor—Diameter of Opening.	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5	6	7	8	9	10
Diameter of Base Flange . . .	Scr'd	Scr'd	Scr'd	Scr'd	Scr'd	5 $\frac{1}{2}$	7	7	8	9	10	10	12	14	15	17	18	19
Diameter of Side Flange . . .	Scr'd	Scr'd	Scr'd	Scr'd	Scr'd	Scr'd	7	7	8	9	10	10	11	13	14	15	16	17
Largest Radius of Balls . . .	2 $\frac{1}{2}$	4	5	5	6	6	6	6	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11	12	12	12	15	15
From Center to Side Flange . .	1 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	5	5	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9	10	11	14
From Base to Center of Inlet . .	1 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3	4	5	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	8	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$	11	15
Extreme Height—Standard Governors .	15	15	20	21	25	26	28	32	34	37	38	43	44	44	51	53	62	67
Height, Inches—Spring Governors .	12	13	13	17 $\frac{1}{2}$	22	23	24	27	29	30	35	36	37	37	41	44	51	53
From Center to End of Shaft . . .	8	9	9	11	13	13	15	15	17	17	17	17	21	21	25	25	28	28
Diameter of Pulley—Standard Governors .	2	2	3	3	3	5	5	5	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$	6	7	7	10	11	12	12
Diameter of Pulley—Spring Governors .	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5	6	6	6
Width of Belt . . .	1	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	2	2	2	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	3	3	3	3	3
Number of Revolutions—Standard Governors .	300	300	250	250	200	200	200	170	170	160	160	160	150	150	130	130	130	115
Number of Revolutions—Spring Governors .	800	800	600	450	400	400	400	350	350	325	275	275	275	275	225	225	225	225
Diameter of Cylinder—300 ft. Piston Speed .	3	4	5	6	7	9	10	12	14	16	18	20	22	26	31	36	40	45
Diameter of Cylinder—400 ft. Piston Speed .	2	3	4	5	6	8	9	10	12	14	16	18	20	23	27	31	35	39
Diameter of Cylinder—500 ft. Piston Speed .	2	3	4	5	6	8	9	10	12	14	16	18	20	23	27	31	35	39
Diameter of Cylinder—600 ft. Piston Speed .	2	3	4	5	6	8	9	10	12	14	16	18	20	23	27	31	35	39

### DIRECTIONS FOR ORDERING GARDNER GOVERNORS.

In ordering Governors, be particular to state if plain or finished is wanted; the style, Spring or Standard; class, "A" or "B" and style of valve chamber as per cuts lettered in catalogue.

We make Governors to fit any engine, but unless special measurements are expressly given in the order, we ship in strict accordance with our tables of dimensions. If, therefore, you wish Governors with any deviation from these dimensions, be particular to so specify. If the speed of the engine is given with the diameter of pulley on the engine shaft, we will furnish the proper size pulley for the Governor. When this is not given, the size pulley mentioned in table of dimensions will be sent.

Standard Governors are recommended for slow and medium speed engines, and Spring Governors for high speed and portable engines.

The speeders and iron pulleys are furnished free with every Governor. If desired, however, we will furnish iron flanges for wooden pulleys.



Figure --- represents the Spring Class "A" pattern, with Speeder, Sawyer's Lever and Automatic Stop.  
Figure --- represents the Spring Class "B" pattern, with Speeder and Sawyer's Lever, but without Automatic Stop.

## PICKERING GOVERNORS.

Uniformly successful on all makes and styles of Steam Engines.

There are more Pickering Governors in use than any other type

**MATERIALS AND WORKMANSHIP OF HIGHEST GRADE.**

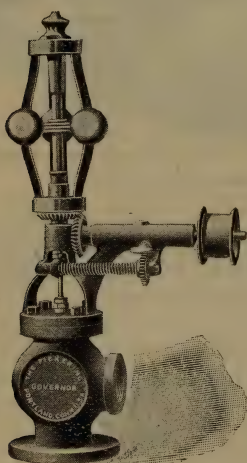


Fig: 2, Class B, represents Governor with Speeder attachment by use of which the speed of Engine can be varied while in motion. Also provided, when ordered, with Sawyer's Lever without additional charge.

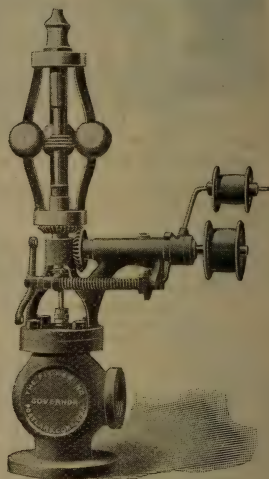


Fig. 4, Class A, represents the Governor with Automatic Stop, which closes the Valve when belt breaks. This device is simple and certain in its action. When Governor is driven by vertical belt, order should so specify.

### Governors for Gas Engines.

Pickering Governors are also largely used on gas engines. They are attractive in appearance, give highest efficiency, and cost less than the devices in common use. We solicit correspondence from builders who desire to improve their manufacture.

## PICKERING GOVERNORS.

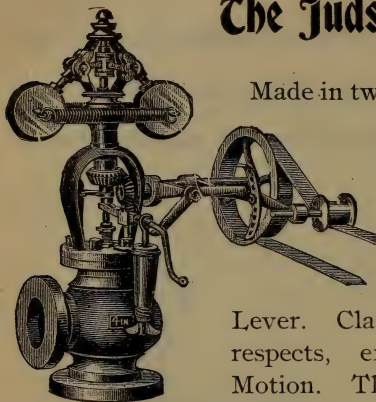
## PRICE LIST AND DIMENSIONS.

The following table of prices and dimensions refers to Class A and B Governors shown on preceeding page. Valve chambers of different forms are provided as required, usually without extra charge, and other changes can be made to meet special conditions.

Governor.	Class B. Plain.	Class B. Finished.	Class A. Plain.	Class A. Finished.	Diam. Base Flange.	Diam. Side Flange.	Speed of Governor.	Diam. of Pulley.	Width of Belt
½ Inch	\$14.00	\$16.00			Screw or 3 ½	Screw	500	1 ½	¾
¾ "	16.00	18.00			Screw or 3 ½	Screw	500	1 ½	¾
1 "	18.00	20.00	\$21.00	\$23.00	Screw or 4 ½	Screw	450	2	1 ¼
1 ¼ "	21.00	24.00	24.50	27.50	Screw or 5	Screw	450	2	1 ¼
1 ½ "	25.00	29.00	29.50	33.50	5 ¾	Screw	420	2 ½	1 ½
2 "	30.00	34.00	36.00	40.00	6 ½	Screw	420	2 ½	1 ½
2 ¼ "	35.00	40.00	42.00	47.00	7	6	380	3	2
2 ½ "	40.00	45.00	48.00	53.00	7 ½	Screw or 6 ½	380	3	2
3 "	50.00	58.00	59.00	67.00	9	8	320	4	2
3 ½ "	60.00	69.00	71.00	80.00	10	8 ½	320	4	2
4 "	71.00	81.00	83.00	93.00	11	9 ½	320	5	2 ½
4 ½ "	83.00	94.00	96.00	107.00	11	10	320	5	2 ½
5 "	94.00	106.00	109.00	121.00	12	11	275	5	2 ½
6 "	122.00	136.00	140.00	154.00	14	13	275	6	3
7 "	150.00	166.00	170.00	186.00	15	14	275	7	3
8 "	185.00	202.00	210.00	227.00	17	15	260	7	3
9 "	215.00	235.00	241.00	261.00	18	16	225	8	3 ½
10 "	240.00	260.00	270.00	290.00	20	18	225	8	3 ½

For full information send for special list.

## The Judson Improved Governor



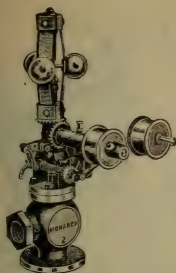
Made in two kinds—STANDARD and SPRING, and described in two classes, A and B—workmanship and quality the same. Class A either Standard or Spring Governor, with Automatic Stop Motion, Spring Speeder and Sawyer's Lever. Class B, the same as Class A in all respects, except without Automatic Stop Motion. The Spring Governor is high speed and the Standard medium speed.

In ordering Governors, state which class is wanted, whether Standard or Spring, Plain or Finished, and with or without Improved Angle or Globe Stop Valve.

Size of Governor Diameter of Opening	$\frac{1}{2}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$
Price Class B Plain.	\$14 00	\$16 00	\$18 00	\$21 00	\$25 00	\$30 00	\$35 00	\$40 00	\$45 00	\$50 00	\$60 00
Price Class B Fin'd.	16 00	18 00	20 00	24 00	29 00	34 00	40 00	45 00	51 00	58 00	69 00
Price Class A Plain.	.....	.....	21 00	24 50	29 50	36 00	42 00	48 00	53 00	59 00	71 00
Price Class A Fin'd.	.....	.....	23 00	27 50	33 50	40 00	47 00	53 00	59 00	67 00	80 00

Size of Governor Diameter of Opening	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$	6	7	8	9	10
Price Class B Plain.	\$71 00	\$83 00	\$ 94 00	\$108 00	\$122 00	\$150 00	\$185 00	\$215 00	\$240 00
Price Class B Fin'd.	81 00	94 00	106 00	121 00	136 00	166 00	202 00	235 00	260 00
Price Class A Plain.	83 00	96 00	109 00	124 00	140 00	170 00	200 00	241 00	270 00
Price Class A Fin'd.	93 00	107 00	121 00	137 00	154 00	186 00	227 00	261 00	290 00





CLASS A.

With Automatic Safety Stop, Speed Adjuster and Valve Lever.



CLASS B. HORIZONTAL.

Special Valve Chambers  
will be fitted to  
Governors if Necessary



CLASS B.

With Speed Adjuster and Valve Lever.



STYLE C.



STYLE D.



STYLE E.



STYLE F.



STYLE G.



STYLE H.

## PRICE-LIST OF THE MONARCH GOVERNORS.

Size of Governor.	1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10
	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Class A, plain .....	16 50	18 50	21 00	24 50	29 50	36 00	42 00	48 00	59 00	71 00	83 00	96 00	109 00	140 00	170 00	210 00	241 00	270 00
Class B, " .....	14 00	16 00	18 00	21 00	25 00	30 00	35 00	40 00	50 00	60 00	71 00	83 00	94 00	122 00	150 00	185 00	215 00	240 00
Class A, finished .....	18 50	20 50	23 00	27 00	33 50	40 00	47 00	53 00	67 00	80 00	93 00	107 00	121 00	154 00	186 00	227 00	261 00	290 00
Class B, " .....	16 00	18 00	20 00	24 00	29 00	34 00	40 00	45 00	58 00	69 00	81 00	94 00	106 00	136 00	166 00	202 00	235 00	260 00

## TABLE OF DIMENSIONS.

Size of Governor .....	1/2	3/4	1	1 1/4	1 1/2	2	2 1/4	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10
Diameter of Base Flange .....	3 1/2	4	4 1/2	5	5 1/2	7	7	8	9	10	11	11	12	14	15	17	18	20
Diameter of Side " .....	3 1/4	4	4 1/2	5	5 1/2	6 1/2	6 1/2	7	8	9	10	10	11	13	14	16	17	18
Center to Side Flange .....	2 1/2	2 1/2	3 1/4	3 1/4	4	4 1/2	4 1/2	5	5 1/2	6	6 1/2	7 1/2	8	8 1/2	9 1/2	10 1/2	11 1/2	13
Center to Base " .....	2 1/2	2 1/2	3 1/4	3 1/4	4	4 1/2	4 1/2	5	5 1/2	6	6 1/2	7 1/2	8	8 1/2	9 1/2	10 1/2	11 1/2	13
Height in inches .....	15	17 1/2	20	22 1/2	24 1/2	27 1/2	28 1/2	29	32 1/2	34	38	40	44	48	52	56	60	64
Radius of Balls .....	3	3 1/2	3 3/4	3 3/4	4	4 1/2	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 1/2	9 1/2	10	10 1/2	11 1/2
Center to End of Shaft .....	7 1/2	9	10	12	12	14	14	14	15 1/2	15 1/2	17	17	18 1/2	20	21 1/2	23	24 1/2	26
Diameter of Pulley .....	1 1/2	2	2	2 1/2	2 1/2	3	3	3	3 1/2	3 1/2	4	4	4	5 1/2	5 1/2	7	7	7
Width of Belt .....	3	1	1	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2	2	2 1/2	2 1/2	2 1/2	3	3	3 1/2	3 1/2	3 1/2
Revolutions per Minute .....	550	500	450	400	375	325	325	310	280	270	260	250	240	240	240	240	240	240
Diam. Cyl. (300 ft. Piston Speed) .....		4	5	6	7	9	10	12	14	16	18	20	22	26	31	36	40	45
Diam. Cyl. (400 ft. Piston Speed) .....		3	4	5	6	8	9	10	12	14	16	18	20	23	27	31	35	39
Diam. Cyl. (500 ft. Piston Speed) .....			3 1/2	4 1/2	5	7	8	9	10	12	14	16	18	21	24	28	31	35
Diam. Cyl. (600 ft. Piston Speed) .....				4	4 1/2	6	7	8	9	11	13	15	16	19	22	25	28	32

## LUNKENHEIMER GAUGE COCKS.

Regrinding Gauge  
Cock.Soft Seat  
Compression Gauge  
Cock. Plain.Soft Seat  
Compression Gauge Cock,  
with Stuffing Box.

Ball Gauge Cock.

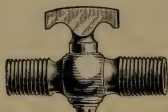
Number .....	00	0	1	2	3	4
Size Blank Shank .....	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{3}{4}$	1	$\frac{7}{8}$	1
Cut for Pipe Thread .....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$
Regrinding Compression Gauge Cock .....	.90	1.05	1.30	1.80	....	....
Soft Seat Compression Gauge Cock .....	.80	.90	1.00	1.10	....	....
Soft Seat, with Stuffing Box. ....	1.00	1.10	1.20	1.30	....	....
Ball Gauge Cock .....	....	....	....	....	.90	1.00



Mississippi Gauge Cock.

Number .....	1	2	3	4
Size Blank Shank .....	$\frac{3}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1
Cut for Pipe Thread .....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$
Mississippi .....	.75	1.00	1.25	1.50

## LUNKENHEIMER AIR COCKS.

Air Cock,  
T. H. & Shoulder.Air Cock,  
Double-End, T. H.Air Cock,  
Bibb Nose, T. H.Air Cock,  
Bibb Nose, L. H.

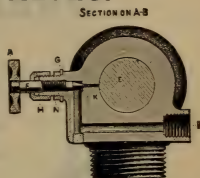
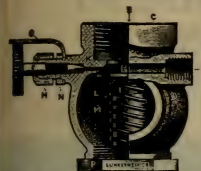
Number .....	1	2	3	4
Size of Blank Shank .....	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$
Size of Shank Pipe Thread .....	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{4}$
T. H. and Shoulder Air Cock .....	.40	.50	.60	.80
T. H. Double-End Air Cock .....	.50	.60	.70	1.00
L. H. Double-End Air Cock .....	.60	.70	.80	1.10
T. H. Bibb Nose Air Cock .....	.65	.75	.90	1.10
L. H. Bibb Nose Air Cock .....	.75	.85	1.00	1.20
T. H. Bibb Nose Air Cock, Hose End .....	.90	1.00	1.25	1.50
L. H. Bibb Nose Air Cock, Hose End .....	1.00	1.10	1.35	1.75

## LUNKENHEIMER GENERATOR VALVES.

### FOR GASOLINE ENGINES.

#### ANGLE PATTERN.

The Angle Pattern Generator Valve has been designed for use on gasoline engines to take the place of a carburetter and for certain purposes will be found more efficient and reliable. Simple in construction and made of few parts there is no liability of giving trouble after being in use a short while. Any one can readily understand how to manipulate this valve to obtain best results.



Size Pipe Connections.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Angle Pattern.....Each	2.60	3.30	4.00	4.80	6.00	7.50

## LUNKENHEIMER AUTOMATIC WATER GAUGE.

### WITH REGRINDING VALVES.

The Lunkenheimer Automatic Water Gauge will be found to be all that its name implies, and can be relied upon to act promptly in shutting off water from gauges when glass breaks; thus the danger and annoyance attendant upon closing of valves attached to gauges is dispensed with.

We call attention to the method of placing the valves, which are put at an offset to the body, thus placing them out of the way, which permits of renewing glasses under full steam pressure. Another feature is the method of making the gauge either right or left hand, as may be desired. This is done by reversing the plugs at top and bottom of gauges, when the position of same can be changed.

While steam pressure is on, to preserve the automatic feature, the valve stems of both gauges should be screwed back as far as they will go, so as to allow ball valves to act promptly when occasion requires.

This gauge is made of gun-metal composition, carefully finished, and we can safely recommend it to our patrons as being thoroughly reliable in every way. The valves are of the well-known Regrinding type and can be easily kept tight. All gauges are carefully tested and fully warranted.



Sectional View of Upper Gauge.



Exterior of Complete Gauge

3-Rod, Part Finished, Iron Wheels, $\frac{3}{4}$ -inch Glass, $\frac{1}{2}$ -inch Pipe Thread.....	Each	12.00
3-Rod, All Finished, Wood Wheels, $\frac{3}{4}$ -inch Glass, $\frac{1}{2}$ -inch Pipe Thread.....	Each	14.50
3-Rod, Part Finished, Iron Wheels, $\frac{3}{4}$ -inch Glass, $\frac{3}{4}$ -inch Pipe Thread.....	Each	12.00
3-Rod, All Finished, Wood Wheels, $\frac{3}{4}$ -inch Glass, $\frac{3}{4}$ -inch Pipe Thread.....	Each	14.50

## LUNKENHEIMER WATER GAUGES.

### TWO-ROD.

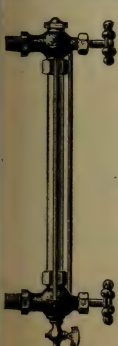
2-Rod, Part Finished, Bronzed Body, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	3.00
2-Rod, Part Finished, Bronzed Body, $\frac{5}{8}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	6.00
2-Rod, All Finished, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	3.75
2-Rod, All Finished, $\frac{5}{8}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	8.00

### THREE-ROD.

3-Rod, Part Finished, Bronzed Body, $\frac{1}{2}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	3.50
3-Rod, Part Finished, Bronzed Body, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	4.00
3-Rod, All Finished, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	5.00
3-Rod, Part Finished, Bronzed Body, $\frac{3}{4}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	8.00
3-Rod, All Finished, $\frac{3}{4}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	9.50

### FOUR-ROD.

4-Rod, Part Finished, Bronzed Body, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	6.00
4-Rod, All Finished, $\frac{5}{8}$ -in. Glass, $\frac{1}{2}$ -in. Pipe.....	Each	6.50
4-Rod, Part Finished, Bronzed Body, $\frac{3}{4}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	8.50
4-Rod, All Finished, $\frac{3}{4}$ -in. Glass, $\frac{3}{4}$ -in. Pipe.....	Each	10.00



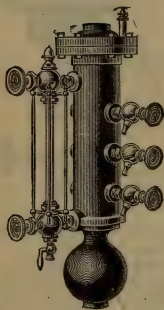
Two-Rod.



Three-Rod, with Regrind. Valves.

All Water Gauges have a plug in top for replacing glass tube.

# WRIGHT IMPROVED SAFETY WATER COLUMNS



## THE IMPROVEMENTS

The superiority of the Wright Safety Water Columns will at once be recognized for the following reasons:

- ONE VERTICAL INSTEAD OF TWO HORIZONTAL VALVES
- ONE SEAMLESS ROUND FLOAT INSTEAD OF TWO OBLONG FLOATS WITH SEAMS.
- ALL PARTS ATTACHED TO THE CAP GAUGE COCKS ON EITHER SIDE.
- EXTRA HEAVY CONSTRUCTION



These points of superiority put the Wright Safety Water Column at the head of the list.

## Price List of the Wright Improved Safety Water Columns

Combined High and Low Water Alarms					General Dimensions in Inches										
Size of Column	Kind and Size of Boiler	Variation between Alarms	List Price of Columns without Water Gauge and Gauge Cocks	List Price of Water Gauge and Gauge Cocks	Steam and Water Connections	Flow-off	Water Gauge	Gauge Glass	Gauge Cocks Centers	Gauge Cocks Size	Center of Water Connection to Top of Column	Diam of Column	Length over all	Size of Column	
1	36'' to 54''	6''	\$28 00	\$ 17 00	1	$\frac{1}{4}$	$\frac{1}{2}$ x 14	$\frac{3}{8}$ x 12	3	$\frac{1}{2}$	17	4 $\frac{1}{2}$	24 $\frac{1}{2}$	1	
5	56'' to 72''	8''	30 00	110 00	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$ x 15	$\frac{3}{4}$ x 13	4	$\frac{3}{8}$	21	5	30	5	
7	Others determined by natural variation of water in boiler	12''	35 00	110 00	1 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$ x 18	$\frac{3}{4}$ x 16	6	$\frac{3}{8}$	24	5	33 $\frac{1}{2}$	7	
9		18''	40 00	115 00	1 $\frac{1}{2}$	1	$\frac{3}{4}$ x 24	$\frac{3}{4}$ x 22	9	$\frac{3}{8}$	30	5	39	9	
11		24''	42 50	115 00	1 $\frac{1}{2}$	1	$\frac{3}{4}$ x 30	$\frac{3}{4}$ x 28	12	$\frac{3}{8}$	36	5	45	11	
13		30''	45 00	120 00	1 $\frac{1}{2}$	1	$\frac{3}{4}$ x 36	$\frac{3}{4}$ x 34	10	$\frac{3}{8}$	42 $\frac{1}{2}$	5	51	13	
15	See Note	36''	50 00	120 00	1 $\frac{1}{2}$	1	$\frac{3}{4}$ x 42	$\frac{3}{4}$ x 40	12	$\frac{3}{8}$	48 $\frac{1}{2}$	5	57	15	

Low Water Alarms					General Dimensions in Inches										
Size of Column	Kind and Size of Boiler	Variation between Alarms	List Price of Columns without Water Gauge and Gauge Cocks	List Price of Water Gauge and Gauge Cocks	Steam and Water Connections	Flow-off	Water Gauge	Gauge Glass	Gauge Cocks Centers	Gauge Cocks Size	Center of Water Connection to Top of Column	Diam of Column	Length over all	Size of Column	
2	36'' to 54''	.....	\$25 00	\$ 17 00	1	$\frac{1}{4}$	$\frac{1}{2}$ x 14	$\frac{3}{8}$ x 12	3	$\frac{1}{2}$	17	4 $\frac{1}{2}$	24 $\frac{1}{2}$	1	
6	54'' to 72''	.....	28 00	110 00	1 $\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{4}$ x 15	$\frac{3}{4}$ x 13	4	$\frac{3}{8}$	20	5	28	6	
8	Water Tube	.....	35 00	115 00	1 $\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4}$ x 18	$\frac{3}{4}$ x 16	6	$\frac{3}{8}$	24	5	33	8	

† Compression gauge cocks with stuffing box

‡ Lever gauge cocks

\* Two glasses joined at center with stuffing box

Four gauge cocks

NOTE—The size of the Column is in all cases determined by the natural variation of the water in the boiler on which it is to be used. No mistake will be made ordinarily by selecting a Column having the extreme gauge cocks the same distance apart as on the Column used on the boiler on which it is to be used.

**IMPORTANT** All working parts are attached to the cap and are removed when the cap is removed. No expert help or special tools are needed to repair these columns.

Provision is made for gauge cocks on either side of all these columns. This does away with all trouble about right and left hand columns, and renders all stock available for filling orders and a comparatively small stock answers for quite a considerable demand.

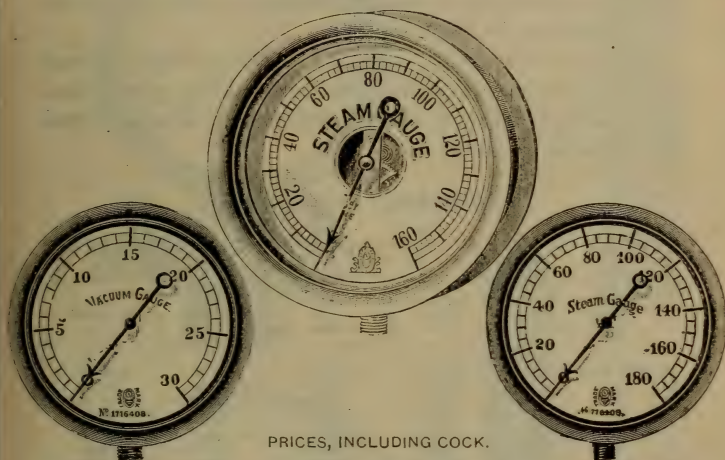
**Include the Wright Improved Safety Water Columns in all Boiler Specifications**



## BOURDON GAUGES.

SINGLE SPRING.

Fig. 59a.



PRICES, INCLUDING COCK.

SIZE.	Iron Case, Brass Ring.	Iron Case, N. P. Ring.	Brass Case.	N. P. Case.	Brass Deep Case, O. G. or Oct. Ring.	N. P. Deep Case, O. G. or Oct. Ring.
Fig. 59A, 24 inch Dial,	\$200.00	\$206.00	\$260.00	\$280.00		
" 20 "	135.00	140.00	190.00	203.00		
" 18 "	120.00	113.00	155.00	167.50		
" 16 "	90.00	92.00	125.00	135.00		
" 14 "	75.00	76.50	100.00	107.50		
" 12 "	50.00	51.50	75.00	79.00	\$80.00	\$84.00
" 10 "	32.00	33.00	40.00	43.00	44.00	47.00
Fig. 8, 8½ "	22.00	22.75	30.00	32.50	33.50	36.00
" 6¾ "	16.00	16.60	20.00	22.00	23.00	25.00
" 6 "	13.00	13.50	16.00	17.50	18.50	20.00
" 5½ "	10.00	10.25	12.00	13.25	13.75	15.00
" 5 "	8.00	8.20	11.00	12.00	12.50	13.50
" 4½ "	8.00	8.20	10.00	11.00	11.50	12.50
" 3½ "	7.00	7.18	9.00	9.75	10.25	11.00
" 3 "	6.00	6.15	8.00	8.60	9.25	9.75
" 2½ "	6.00	6.15	8.00	8.60	9.25	9.75
" 2 "	6.00	6.15	8.00	8.60	9.25	9.75
exc. 1½ "			10.00	10.60		
" 1 "			12.00	12.60		

No Gauge warranted unless connected by a Siphon.

# HYDRAULIC GAUGES.

WITH STEEL TUBE SPRING

The superiority of the SCHAEFFER & BUDENBERG Hydraulic Gauges over all others is generally conceded and proved by the large demand which exists for them.

The *Steel Tube Springs* employed therein were *first invented by us* and have been in practical use for over thirty years. Having been improved from time to time, they are now as perfect as springs can be made.

## STANDARD PRICE LIST.

For any Pressure not exceeding 20,000 lbs. per Square Inch.

Size.	Iron Case, Brass Ring	Iron Case N. P. Ring	Brass Case.	N. P. Case.
12 inch Dial.....	\$110.00	\$111.50	\$125.00	\$129.00
10 ".....	90.00	91.00	100.00	103.00
8½ ".....	70.00	70.75	80.00	82.50
6¾ ".....	50.00	50.60	60.00	62.00
6 ".....	35.00	35.50	40.00	41.50
5 ".....	30.00	30.50	35.00	36.00
4½ ".....	25.00	25.50	30.00	31.00
3½ ".....	22.00	22.50	26.00	26.75

For Maximum hand add \$5.00 to the list.

No extra charge for marking tons per Ram on Dials.

In ordering state diameter of Piston and highest pressure to be carried, in pounds per square inch.

Fig. 14a. **Valve to Protect Gauges** against damage arising from sudden removal of pressure.... \$ 8.00

Fig. 14b. **Needle Stop Valve**..... 10.00

Unless otherwise ordered the connection of Gauges as well as Valves is ½ inch straight pipe thread, and a Copper Washer is furnished with Gauge and Valves for end packing.

Recording Hydraulic Gauges,

## PRESSURE GAUGES FOR NATURAL GAS.

## PRESSURE GAUGES FOR NATURAL GAS.

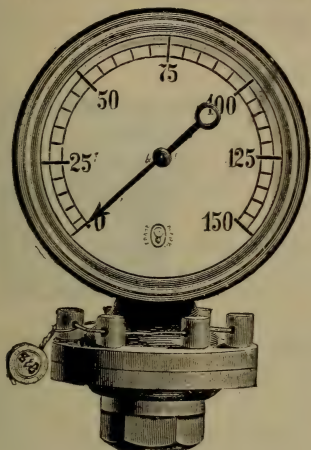


Fig. 1.

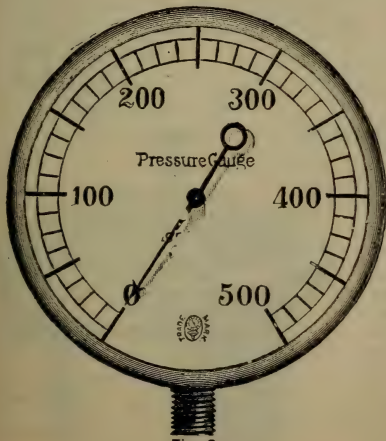


Fig. 2.

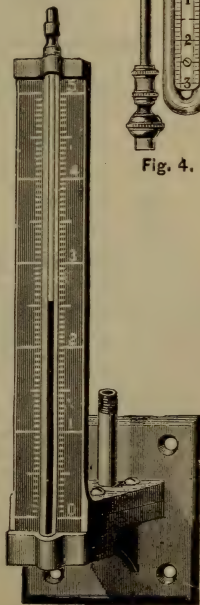


Fig. 3.

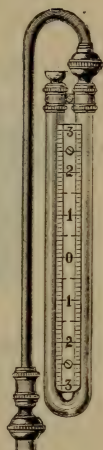


Fig. 4.

These Gauges are made for any desired pressure, to suit the high initial as well as low reduced pressures.

## SCALE OF PRICES.

## FIG. 1. STEEL DIAPHRAGM GAUGE.

6 inch Dial, for pressures not exceeding 300 lbs \$12.00

## FIG. 2. PRESSURE GAUGE.

6 inch Dial, with Steel Tube Spring, for any  
required pressure..... 35.00

6 inch Dial, with Brass Tube Spring is not  
recommended for pressures higher than  
1000 lbs..... 35.00

## FIG. 3. OPEN MERCURY GAUGE.

For 3 lb. pressure.....	5.00
" 5 lb. " .....	5.00
" 7 lb. " .....	6.00
" 10 lb. " .....	8.00
" 15 lb. " .....	12.00
" 20 lb. " .....	16.00
" 25 lb. " .....	20.00

## FIG. 4. SIPHON PRESSURE GAUGE.

4 inch Nickerled.....	5.00
6 " " .....	6.50
8 " " .....	8.00
10 " " .....	10.00
12 " " .....	12.00
14 " " .....	15.00
16 " " .....	18.00
18 " " .....	22.00
20 " " .....	28.00
24 " " .....	35.00



## THE NASON STEAM TRAPS.

## THE "NASON" TRAPS.

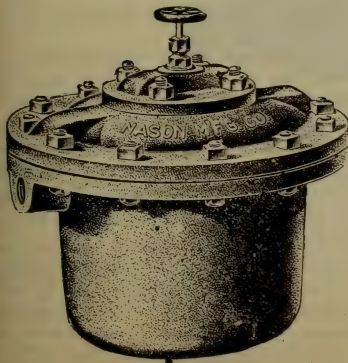


(Size No. 1.)

For Pressures of 80 lbs. or less

NUMBER OF STEAM TRAP.....	1	2	3	4	5
Size of Pipe Connections.....inch	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Diameter outside of Flanges....."	$10\frac{3}{4}$	$14\frac{1}{4}$	$15\frac{3}{4}$	19	$24\frac{1}{4}$
Diameter of Cylinder....."	8	$10\frac{1}{2}$	12	14	18
Height to top of Valve....."	11	14	$16\frac{1}{4}$	$18\frac{1}{2}$	$23\frac{1}{2}$
Height to top of Cover....."	8	10	$12\frac{1}{4}$	14	$15\frac{1}{2}$
Maximum discharge lbs. water per min.	2	5	8	12	20
Greatest number of square feet of surface to which it should be applied.....	350	900	1400	2000	3500
Greatest number of lineal feet of 1-in. pipe surface to which it should be applied...	1050	2700	4200	6030	10500
Weight, lbs. "Nason".....	40	80	113	176	336
Weight, lbs. "Sidelug".....	47	92	125	212	343
Price, "Nason".....	\$16.00	\$20.00	\$27.50	\$42.50	\$70.00
Price, "Sidelug".....	16.85	21.30	29.25	45.50	74.75

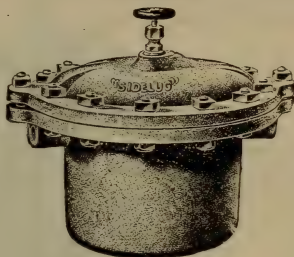
## THE "NASON" TRAPS.



(Sizes No. 4 and 5.)

## THE "SIDELUG" TRAPS.

(Patented)



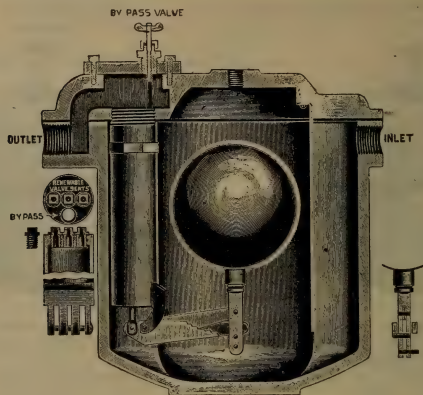
(Size No. 1.)

For Pressures ranging from 80 to 150 lbs.

1	2	3	4	5
$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
$10\frac{3}{4}$	$14\frac{1}{4}$	$15\frac{3}{4}$	19	$24\frac{1}{4}$
8	$10\frac{1}{2}$	12	14	18
11	14	$16\frac{1}{4}$	$18\frac{1}{2}$	$23\frac{1}{2}$
8	10	$12\frac{1}{4}$	14	$15\frac{1}{2}$
2	5	8	12	20
350	900	1400	2000	3500
1050	2700	4200	6030	10500
40	80	113	176	336
47	92	125	212	343
\$16.00	\$20.00	\$27.50	\$42.50	\$70.00
16.85	21.30	29.25	45.50	74.75

For higher pressures a radical departure in construction of the covers has been designed and patented, consisting of so reinforcing the joints at the point of inlet and outlet where the steam ports pass from pots to covers, that leaks near these places cannot occur, there being no possibility of the gaskets blowing out. A considerable increase in the number of bolts used for each size has been adopted, thus rendering these traps not only amply equal to the extreme work imposed upon them, but infinitely better than anything hitherto made in this class of trap. These traps are known as the Nason "SIDELUG" trap, and should be universally specified in all cases where they are to be used in connection with pressures exceeding 80 lbs.

## THE WRIGHT EMERGENCY STEAM TRAP



A Trap which will Dispose of an Unusual Inflow of Water Instantly and Waste no Steam  
FOR PRICES AND DIMENSIONS SEE NEXT PAGE

### DESCRIPTION



THREE steam tight outlet valves are employed instead of one. These valves are placed at the top of the trap, as far removed from dirt, grit and sediment as possible. The water enters, filling the trap to the center of the float and forming a seal of four to six inches of water over the lower end of the outlet pipe, thus preventing the escape and waste of steam.

When thus filled, sufficiently to raise the float, one valve is opened slightly if there is but little water coming into the trap, but widely in event of a sudden inflow of water. This one valve is equal to the task of taking care of the water under ordinary conditions, but in event of water coming into the trap faster than the one valve can discharge it, the water rises in the trap, carrying the float up with it and opening the second and third valve successively, if necessary. It will be observed that the discharge of each of these valves is continuous and that the action of the trap in emergencies is instantaneous.

### MECHANICAL SUPERIORITY

It is believed that these Traps excel in many details which go to make a successful trap. The valves are not only placed where they are least likely to become obstructed by sediment, or be worn out and rendered inoperative by grit, but are renewable without disturbing the piping or even taking off the cap. All the working parts are attached to the cap and may be removed without disturbing the piping.

The inlet and outlet being both on the same line, this Trap may be let into the floor, if necessary, in order to obtain the desired inclination to the pipe leading to the Trap, without which the efficiency of the heating system will be greatly impaired.

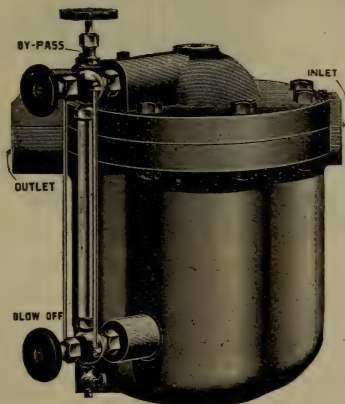
The traps are provided with a by-pass which may be used at will and which many engineers rightly insist upon having. Traps not provided with a by pass are rendered inoperative if the valves become stopped up.

Provision is made for a water gauge, with which the operation of the trap may be watched.

They have wide and thick flanges and sufficient bolts to not only insure safety, but to prevent all trouble and annoyance by blowing out gaskets.

They are mechanical in design and workmanship and in every detail as near perfect as skill and experience, combined with a new factory and modern equipment can make them.

The floats are seamless and round—the strongest possible form for a float, and are made for high pressure service. They are tested to 300 pounds hydrostatic pressure and guaranteed for a working pressure of 150 pounds.



### PRICE LIST OF THE WRIGHT EMERGENCY STEAM TRAP

Size of Trap . . . . .	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Size of Inlet and Outlet . . . . .	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2"
Diameter through Inlet and Outlet . . . . .	8 $\frac{1}{4}$ "	12"	12 $\frac{3}{4}$ "	13 $\frac{3}{4}$ "	15 $\frac{1}{4}$ "	16 $\frac{1}{4}$ "
Maximum Discharge in Gallons per hour	75	110	180	360	480	720
Intended for not Exceeding . . . . . Square Feet of Radiating Surface.	900	1350	2250	4500	6000	9000
Intended for not Exceeding . . . . . Lineal Feet of 1 inch Pipe.	2700	4000	6750	13500	18000	27000
List Price . . . . .	\$25.00	\$30.00	\$40.00	\$55.00	\$75.00	\$100.00

**NOTE:** The actual capacity of these Traps is double the capacity indicated in square feet and lineal feet of 1 inch pipe, 50 per cent. of their capacity being reserved for emergencies.

## THE IMPROVED "ACME" STEAM TRAP WITH BY-PASS.

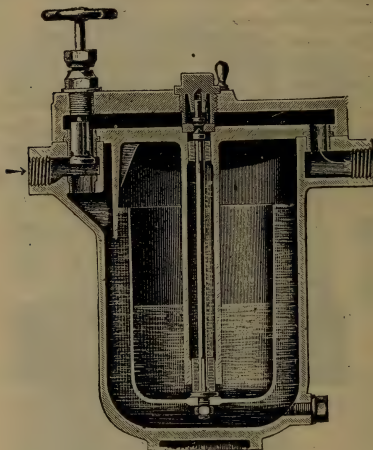


Fig. 10.

This Trap is substantially the same construction as the one illustrated in Fig. 8, but is provided with a By-Pass and Valve for the quick discharge of water and dirt which may have accumulated in the pipe while the Trap was shut off and not working.

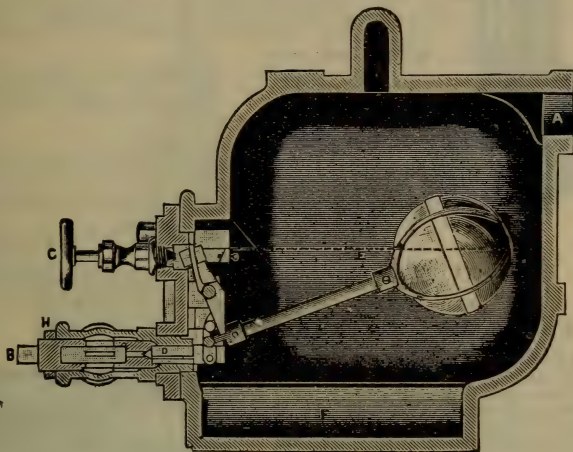
The By-Pass is opened by screwing down the valve-spindle. With the By-Pass closed the Trap will work in the same manner as described in Fig. 8.

### DIMENSIONS, CAPACITIES AND PRICES.

NUMBER OF TRAP.	2	3	4	5
Size of Pipe Connections.....	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Entire Height of Trap.....	$9\frac{1}{2}$	12	14	17
Entire Width of Trap.....	10	$12\frac{1}{2}$	15	18
Will drain lineal feet of 1 in. pipe.....	3,000	4,500	7,000	10,800
Will drain square feet of surface.....	1,000	1,500	2,400	3,600
Prices.....	\$20.00	\$27.50	\$42.50	\$70.00

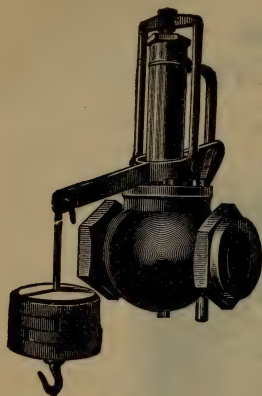


## THE ANDERSON IMPROVED STEAM TRAP



### SIZES AND CAPACITY

Size of Traps,	1	2	3	4	5	6
Size of Connections	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Maximum discharge per minute of condensation.	3 lbs.	5 lbs.	8	14	20	30
Greatest number of square feet of surface that should be applied.	500	800	1,350	2,350	3,500	5,000
Greatest number of lineal feet of 1-inch pipe surface that should be applied.	1,500	2,500	4,000	7,000	10,000	15,000
Prices,	\$20.50	\$22.50	\$28.00	\$35.00	\$50.00	\$70.00



## G. M. DAVIS REDUCING VALVES

### STYLE NO. 1

Adapted for all purposes for steam reduction. Guaranteed to reduce any variable pressure to any lower pressure and maintain same unvarying and uniform irrespective of demand or fluctuation of initial pressure. Made entirely of metal, and has no diaphragms, springs nor packing. Made for air or water at no extra charge.

### STYLE NO. 2

Same as Style No. 1, with addition of dash pot. Recommended to be used where there is a pulsation or vibration in steam, as in connection with engines, pumps, exhaust steam heating, etc.

#### PRICE LIST NO. 1

Size...	¾	1	1½	2	2½	3	3½	4	5	6	7	8	10	12	14	16	18
Price..	20	22	24	26	30	35	40	50	60	75	100	135	175	275	400	500	800

#### PRICE LIST NO. 2

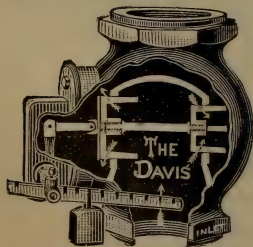
Size...	¾	1	1½	2	2½	3	3½	4	5	6	7	8	10	12	14	16	18
Price..	25	27	29	30	36	42	48	58	70	90	120	160	200	300	435	525	825

NOTE—Lane Standard Flange Dimensions and Template used.

## DAVIS CONTINUOUS FLOW TRAPS....

Unequalled for capacity per hour and especially designed to eliminate flooding. Seamless copper floats guaranteed 300 lbs. pressure. This trap can be used interchangeably on low pressure and high pressure conditions without changing or adjusting a part. Foreign matter does not interfere with its operation.

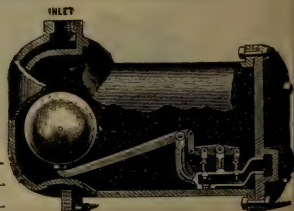
Number..	00	0	1	2	3	4
Inlet.....	½-in.	¾-in.	1-in.	1¼-in.	1½-in.	2-in.
Capacity.	1,500	3,000	6,500	15,000	20,000	30,000
Price.....	\$15 00	\$20 00	\$30 00	\$45 00	\$60 00	\$80 0



## DAVIS NOISELESS BACK PRESSURE VALVE....

Sliding differential valves make but the ordinary weighting back necessary on this valve. Guaranteed noiseless. Small, compact and neat. Flanged or screwed valves can be placed in six different positions without impairing its perfect operation.

Size....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16	18
Length	7½	7½	8½	9	10	10½	11½	13	14½	16½	18	19	21	23	26	29½
Price...	\$14	\$16	\$18	\$22	\$25	\$30	\$40	\$60	\$80	\$100	\$120	\$145	\$220	\$345	\$465	\$600



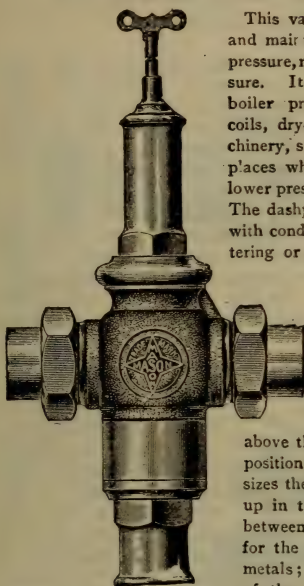
## DAVIS DAMPER REGULATOR

Built especially for high pressure boilers. Easily operated on 5 lb. boilers as well. Guaranteed to effect a saving of from 10 per cent to 20 per cent as conditions may warrant. No springs, no diaphragms, no packings. Made entirely of metal.



NET PRICE....\$50

## THE MASON REDUCING VALVE.



This valve is designed to reduce and maintain an even steam or air pressure, regardless of the initial pressure. It will automatically reduce boiler pressure for steam-heating coils, dry-rooms, paper-making machinery, slushers, dye-kettles, and all places where it is desirable to use lower pressure than that of the boiler. The dashpot, which immediately fills with condensation, prevents all chattering or pounding, and requires no

attention. No extra lock-up attachment is needed, as the pressure is regulated by a key, which the engineer retains. The sizes, up to and including 2-inch, are made of the best composition, and

above that, of cast iron, with composition linings. In the larger sizes the composition lining is hung up in the valve, leaving a space between the iron and composition for the unequal expansion of the metals; thus there is no possibility of the piston sticking when the

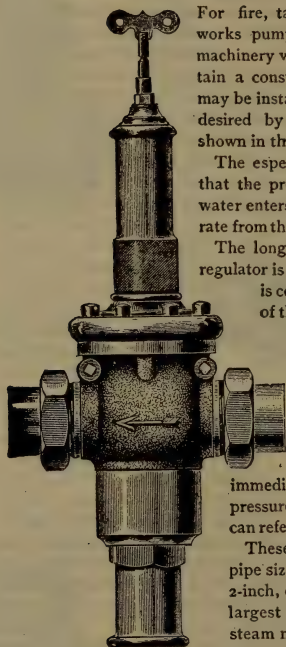
valve is heated. The area of the passage from the high to the low pressure side of the valve is equal, when open, to the full area of the pipe, so that a low pressure of the system, almost equal to the initial high pressure, may be carried.

To increase pressure, turn the Key in the direction taken by the hands of a watch.

## PRICE-LIST.

$\frac{1}{2}$ inch.....	\$18.00	3 inch.....	\$72.00
$\frac{3}{4}$ " .....	18.00	$3\frac{1}{2}$ " .....	85.00
1 " .....	22.00	4 " .....	100.00
$1\frac{1}{4}$ " .....	28.00	5 " .....	135.00
$1\frac{1}{2}$ " .....	35.00	6 " .....	180.00
2 " .....	44.00	8 " .....	250.00
$2\frac{1}{2}$ " .....	57.00	10 " .....	350.00

## THE MASON PUMP PRESSURE REGULATOR



For fire, tank, elevator, air and water works pumps, or any class of pumping machinery where it is necessary to maintain a constant pressure. The regulator may be instantly adjusted to any pressure desired by simply turning the key as shown in the cut.

The especial feature of this regulator is that the pressure chamber into which the water enters is entirely removed and separate from the steam and all working parts.

The long cylinder at the bottom of the regulator is a dashpot, the piston of which is connected with the main valve of the regulator, thereby preventing sudden and violent "jumping" of the pump when the pressure suddenly changes.

For automatic fire sprinkler service they have been found especially valuable, as the valve is thrown wide open immediately the slightest drop in pressure occurs. On application we can refer parties where they are in use.

These regulators are made in all the pipe sizes; those up to and including 2-inch, of the best steam metal; the largest sizes of cast iron lined with steam metal. The springs are made of the finest tool steel, tempered.

Each size, up to and including 2-inch, is furnished with couplings.

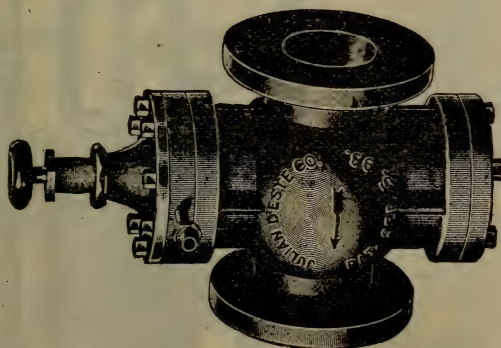
### PRICE LIST.

SIZE PIPE.	PRICE.	SIZE PIPE.	PRICE.
$\frac{1}{2}$ inch.....	\$20.00	2 inch.....	\$55.00
$\frac{3}{4}$ " .....	20.00	2 $\frac{1}{2}$ " .....	68.00
1 " .....	25.00	3 " .....	85.00
1 $\frac{1}{4}$ " .....	30.00	3 $\frac{1}{2}$ " .....	100.00
1 $\frac{3}{4}$ " .....	42.00	4 " .....	115.00



# PUMP PRESSURE REGULATOR

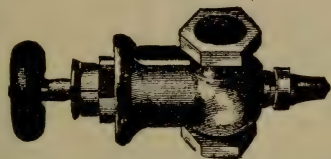
For Hydraulic and Air Pressure.



## PRICE-LIST.

SIZE PIPE.	PRICE.	SIZE PIPE.	PRICE.
1 inch, Screwed,	\$25.00	3 inch, Flanged,	\$72.00
1½ " "	28.00	4 " "	100.00
1¾ " "	35.00	5 " "	135.00
2 " "	44.00	6 " "	180.00
2½ " Flanged,	57.00		

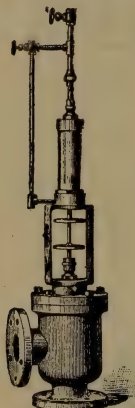
FOR STEAM.



## PRICE-LIST.

SIZE PIPE.	PRICE.
1 inch, Screwed	\$22.00
1½ " "	28.00
1¾ " "	35.00
2 " "	44.00
2½ " "	57.00
3 " Flanged	72.00
4 " "	100.00

## Pump Governor THE FISHER



SCREWED		FLANGED	
1/2	" ..... \$25.00	1 1/2 inch.....	\$45.00
3/4	" ..... 27.50	2 "	50.00
1	inch..... 30.00	2 1/2 "	60.00
1 1/4	" ..... 35.00	3 "	75 00
1 1/2	" ..... 42.50	3 1/2 "	87 50
2	" ..... 50.00	4 "	100.00
2 1/2	" ..... 58.00	5 "	125 00
3	" ..... 70.00	6 "	150.00
		8 "	225.00

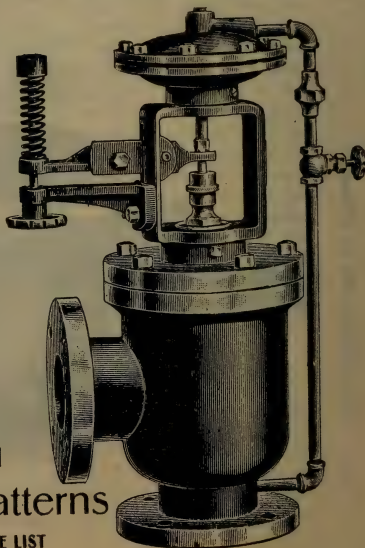
## Reducing Valve

### TWO STYLES

One with weight and lever  
and the other with spring.

SCREWED	
1 inch . . . .	\$30 00
1 1/4 " . . . .	35 00
1 1/2 " . . . .	42 50
2 " . . . .	50 00
2 1/2 " . . . .	58 00
3 " . . . .	70 00

FLANGED	
1 1/2 inch.....	\$45 00
2 " . . . .	50 00
2 1/2 " . . . .	60 00
3 " . . . .	75 00
3 1/2 " . . . .	87 50
4 " . . . .	100 00
5 " . . . .	125 00
6 " . . . .	150 00
8 " . . . .	225 00



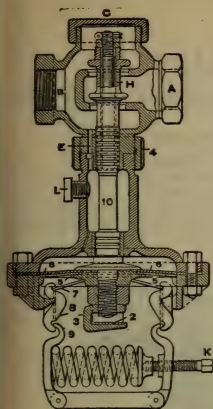
Made in Angle and  
Globe Patterns

BOTH STYLES TAKE THE SAME LIST

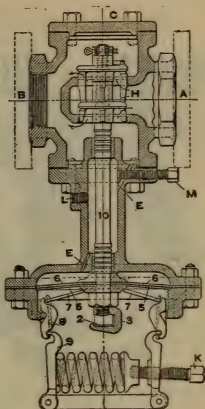
## THE FOSTER "CLASS Q" REGULATOR.

For LOW PRESSURES, Not Exceeding  
15 Lbs. Delivery, as in Steam  
Heating, Etc., Etc.

NOTE.—A strainer should always be applied to valves required for low-pressure service, such as steam heating, etc. See Price List on preceding page.



"Class Q,"  
with Spanner Nut.  
Sizes 2 in. and under.



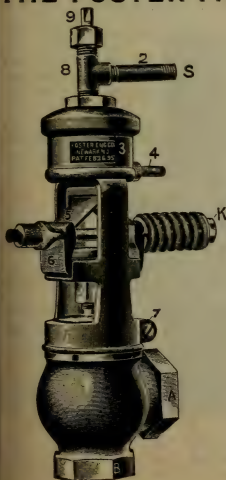
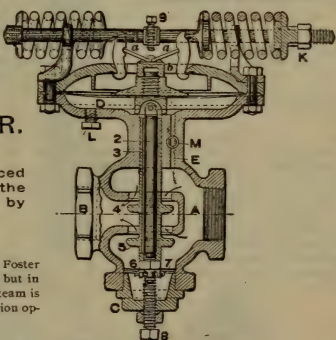
"Class Q," with Flanges.  
Sizes 2 1/4 in. and over.

Size.....Inches	1	1 1/4	1 1/2	2	2 1/4	3	3 1/4
Screwed.....Each	20.00	24.00	28.00	33.00	40.00	48.00	55.00
Flanged.....Each				38.00	43.00	52.00	60.00
Size.....Inches	4	5	6	8	10	12	
Screwed.....Each	70.00	85.00	120.00	200.00	300.00	350.00	
Flanged.....Each	75.00	90.00	125.00				

## THE FOSTER FAN ENGINE REGULATOR.

For Induced or Forced  
Drafts. Regulating the  
Speed of the Fan by  
the Pressure in  
the Boilers.

Similar in construction to the Foster  
"Class W" Regulating Valve, but in  
making the connections the steam is  
permitted to flow in the direction op-  
posite that in the "Class W."

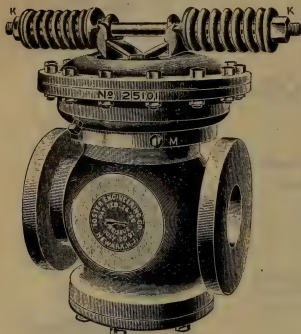


FAN ENGINE REGULATOR, INCLUDING STRAINERS									
Size.....Inches	1/2	3/4	1	1 1/2	2	2 1/2			
All Steam Metal.....Each	21.00	23.00	25.00						
Iron Body.....Each				32.00	39.00	49.00	63.00		
For Gun Metal, add to net price of Iron Body (no discount)....	4.00	6.00	11.00						

## THE FOSTER PISTON- ACTUATED PUMP GOVERNOR. WITH COMPENSATING SPRING.

Designed to meet the demand for a governor controlled solely by the discharge pressure. Made of the best steam metal in smaller sizes, up to 2 inches inclusive, and larger sizes of iron bodies with brass trimmings. The valve clappers have "Jenkins' Composition Discs," which can be renewed and applied by any engineer and insure perfectly tight seats. The compensating spring movement allows the steam valve to open or close instantly, to the fullest extent necessary, with slight variation of discharge pressure.

Size.....Inches	1/2	1	1 1/4	1 1/2	2	2 1/2	3	4	5
Price.....Each	18.00	20.00	22.00	25.00	30.00	35.00	40.00	50.00	65.00



"Class W," 2½ in. to 6 in.

Dimensions given herewith are standard. Flanges of different dimensions or distances between faces are made only to order, at additional price. Drilling Flanges extra.

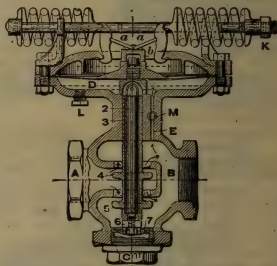
Special Valves, made of Government composition, only to order at an extra net price of 30 cents per pound gross weight of Regulator, subject to change without notice.

In ordering, state initial and delivery pressures — also service. In the absence of this information all Regulators will be provided with a spring to deliver pressures between 10 and 60 lbs.

## THE FOSTER "CLASS W" PRESSURE REGULATOR.

### LEADING FEATURES:

1. A compensating spring movement, exerting an unvarying power on the diaphragm.
2. Full steamway through the valve.
3. Great simplicity of construction and operation.
4. No friction of parts.
5. No small ports to clog.
6. No dashpot.
7. Noiseless — no chattering.
8. Absolutely automatic after adjustment as to pressure.

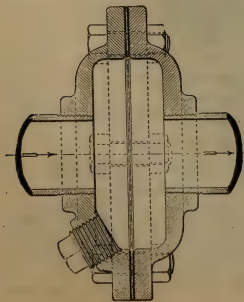


"Class W," ¼ in. to 2 in.

Size.....Inches	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16	18
Screwed Ends.....Each	\$18	\$20	\$22	\$28	\$35	\$44	\$57	\$72	\$90	\$100	\$120	\$135	\$180							
Flanged Ends.....Each		22	24	30	37	46	60	75	95	105	125	140	185	\$220	\$260	\$350	\$450	\$575	\$700	\$875
Diameter of Flanges.....Inch.		3¾	4½	5	5½	6	7	7½	8½	9	9½	10	11	12½	13½	16	19	21½	23½	25
Distance between Faces.....In.		4½	5½	5½	6	7	9	10	11	12	14	15	17	18½	20½	23½	27½	31	35	37½

### APPROXIMATE WEIGHTS.

Iron Bodies, Screwed...Lbs.				19	22	40	60	73	84	139	154	180	233							
Iron Bodies, Flanged...Lbs.				23	28	50	75	80	100	160	174	191	275	390	450	575	1050	1375	1600	1900
Composition, Screwed...Lbs.	5	11	12	21	26	51	70	81	94	155										
Composition, Flanged...Lbs.	13	16	26	32	60	87	95	112	180	193	209	324	480							



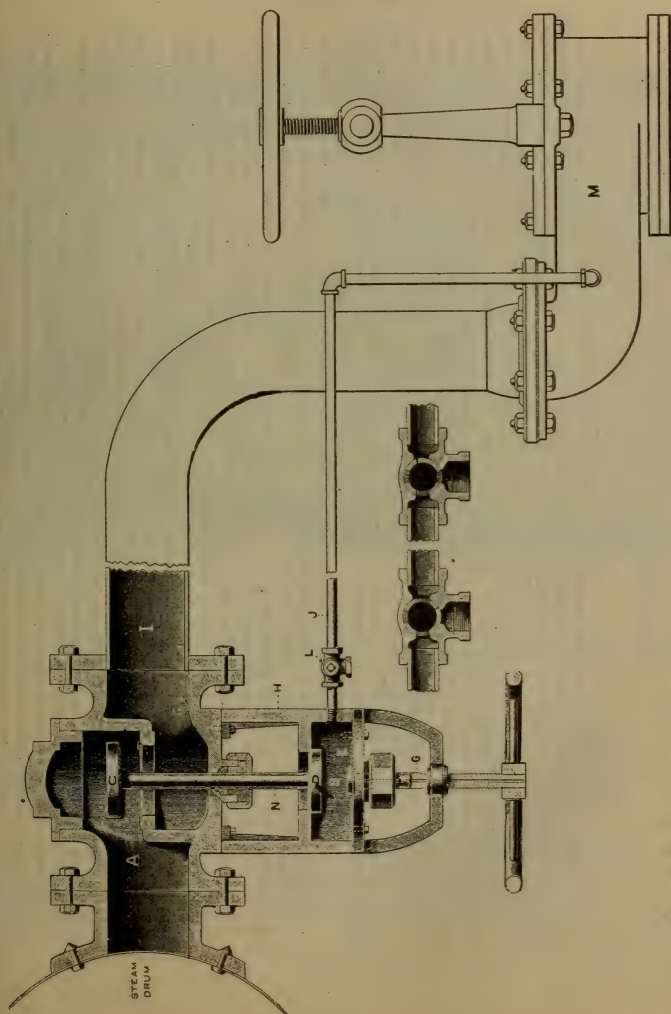
## STRAINERS FOR FOSTER "CLASS W" and "CLASS Q" VALVES.

A strainer has been found desirable in nearly all cases—in many cases absolutely necessary—to prevent scale, grit, cuttings, etc., from lodging on the valve seats. The strainer should be applied on the inlet side of the valve. Its use remedies many supposed defects in valves, which are really chargeable to the piping.

Cut shows strainer for screwed ends. For flanged ends construction is slightly different. Prices quoted are for cast-iron strainers.

Size.....Inches	¾	1	1¼	1½	2	2½	3	4	5	6	7	8	10
Screwed, Each	3.00	3.00	4.00	4.00	5.00	6.00	6.00	9.00	10.00	12.00			
Flanged, inc. attaching to Reg...	6.50	6.50	7.50	10.00	11.50	13.50	16.00	17.00	20.00				





# Johnston's Automatic Cut-off Valve.

PATENTED

This valve is designed for the purpose of automatically closing off steam at the boilers in case of steam pipe bursting; also, to be used in any pipes having to resist pressure of liquids, oils, ammonia, or gases of any kind.

In placing this valve before the public we desire to say that it is in every way perfect and intended to fill a long-felt want.

Hardly a day passes that we do not hear of a steam pipe bursting, causing the loss of many lives and destruction of property. This valve works almost instantaneously in case of the pipe breaking, and only allows what steam there is in the pipe to escape.

Most fires lost by the breaking of steam pipes are *not by the first explosion*, but by the continued flow of steam which fills the engine or boiler room and causing the persons therein to be literally *cooked to death* by the continued escaping of steam.

These valves are made of the very best of material and workmanship, every part is easily accessible for packing and grinding. The simplicity of the construction enables us to sell them at very near the same price as an ordinary globe valve.

## EXPLANATION OF ILLUSTRATION.

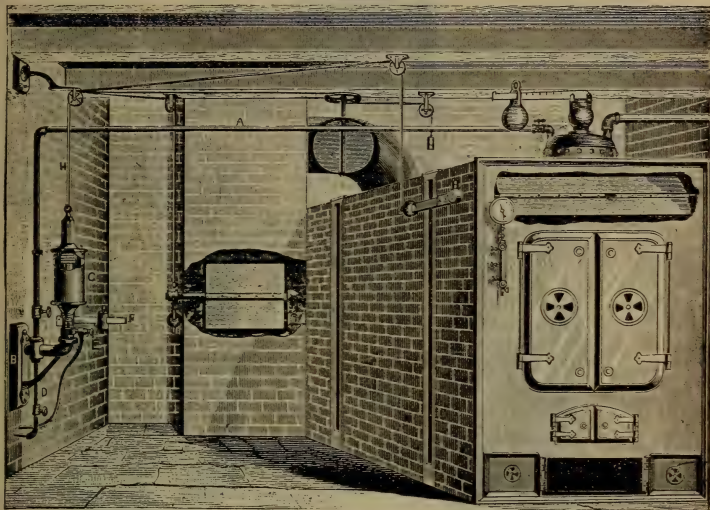
The valve C being connected by the stem N to the valve D in the lower chamber B, which is connected to the main valve by the arches H, is raised by screwing the stem G against the bottom of valve D until it is seated in the opening in the top of chamber B. The steam passes through main valve A, then through main pipe I to the throttle valve M. A small pipe is tapped into the throttle valve M which conducts the pressure to the chamber B and holds the valve D against its seat. The stem G is then run down as shown in cut. Should the main pipe I now burst anywhere between the main valve and throttle it would relieve the pressure in small pipe, also in chamber B. There being no pressure to hold the valve against its seat, the steam rushing through the main valve would force C down to its seat and prevent any more steam from escaping. A three-way cock is placed in the small steam pipe J for the purpose of closing the steam out of chamber B while opening the main

valve; otherwise the steam would pass into the chamber and out of the opening in the top until the valve D was seated. While opening the valve the cock would stand in position as shown in cross section of cock on the right. When valve D is seated the cock is turned in position as shown in the left hand view, allowing the steam to pass through to chamber B. There is a small hole running through the lower stem G through which enough steam will flow if the head is not brought down to the bottom after valve D is closed to warn the engineer in charge that the valve is not in the proper position for working. There is also a small hole in the key of three-way cock which will allow leakage enough to notify should the lower stem G be screwed against the valve D and the steam shut off of chamber B. With these arrangements it is impossible for the valve to be left knowingly not in working order. It will be readily seen that the valve can be used as an ordinary globe valve for shutting the steam off at the boilers if needed to make any repairs necessary to pipe or machinery. By running the lower screw up against the valve D and turning the cock as shown in the right hand view, which will shut the steam off from small pipe L and allow steam from chamber B to escape. By lowering the stem G; the valve will follow by the pressure on the area of stem N until the valve C is closed, or it can be closed by simply turning the cock and allowing the valve to fall. On large valves the valve D will be cushioned so as to allow the valve C to seat without jar. By placing a cock in the small pipe near the throttle it can be used to stop the engine in case of the governor belt breaking, or close off should the engine "run through" or knock out a cylinder head. Wires can also be run over a building to operate on stop-cock to shut down engine in case of an accident.

By using one of these valves for a throttle valve on pumps or ice machine engines and connecting small pipe from chamber B of same to the discharge pipe, it will, by having one also in the discharge pipe, prevent the escape of liquid or gas and shut the steam off of engine.

THE ORIGINAL AND GENUINE  
KELLAM STEAM DAMPER REGULATOR.

Patented.



Over 10,000 of these Machines in use, controlling dampers in different positions (as shown in cut) and giving the very finest results.

The Advantages of the "KELLAM" over all others are:

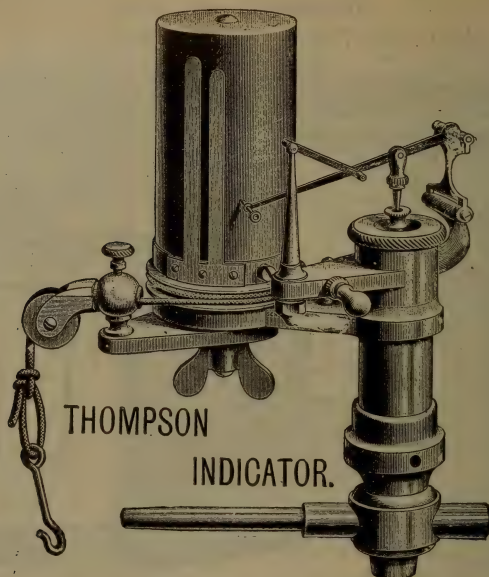
1. That it is controlled by live or dry steam.
2. That it is composed entirely of Steam Metal, with no rubber or leather diaphragm springs or other packing to give out or get out of order.
3. That its construction combines the minimum of friction with the maximum of durability.
4. That it is the only Regulator not affected by intense heat or cold.
5. That it is the most sensitive Regulator known, and will work close to variations of steam pressure.
6. That it is neat and compact, occupying less space than any other.

This Regulator is so constructed that it can be attached to any boiler or steam generator, and will maintain the steam at any desired pressure, any variations from which will check or open the draft as may be required. When once adjusted it requires no further attention, but will do its work perfectly. It is simple in construction, positive in action, not liable to get out of order, will last many years, and is acknowledged by all who are using it as a GREAT FUEL-SAVING MACHINE. It is also invaluable for safety. Our Regulator is not only sure to pay for itself many times over by its saving of fuel, but it is worth more than it costs in its saving to boilers from strain by over-pressure.

In places where the duties of engineers call them away from the boilers, this Regulator is of inestimable value, for as soon as the steam rises above the point of pressure at which it is set it is *sure* to close the draft, at the same time stopping the combustion of the fuel, and as *surely* opening the draft as soon as pressure beginning to fall one particle below the point indicated. Its working is as precise and sure as machinery can possibly be made, and it can be located at any point.

Made in 2 sizes. No. 3 for Dampers up to 3 ft. diam. No. 1 for Dampers above 3 ft. diam.

Prices and sizes of Regulators dependent entirely upon the size and weight of Dampers to be controlled, regardless of the number or capacity of boiler.



<i>Thompson Indicator, Standard Size, brass, nickel-plated, and highly finished, with two Straight-way Cocks, three Springs of various pressures, and corresponding Scales, 100 Metallic Paper Cards, a Screw Driver, a bottle of Oil and an extra Drum Spring all inclosed in finely polished Oak Box with plated trimmings.</i>	\$85.00
<i>The same, made of Steel, nickel-plated, for ammonia use.</i>	120.00
<i>Thompson Indicator, Small Size, and fixtures as above.</i>	75.00
<i>The same, made of Steel, for ammonia use.</i>	100.00
<i>The same, made of Aluminum, for both steam and ammonia.</i>	100.00
Extra Springs, each	5.00
Boxwood Scales, each	.50
Paper Cards, one side metallic, per 100	1.00
" " both sides metallic, pe. 100	1.25
Linen Cord, warranted not to stretch, per hank of 30 feet.	.50
Straight-way Cock, nickel-plated, for steam	2.75
" " " for ammonia	6.00
Three-way Cock, nickel-plated, for steam	6.00
" " " for ammonia	10.00
Detent Motion	3.00

We furnish with each Indicator, free of charge, a copy of "Indicator Practice and Steam Engine Economy," by Frank F. Hemenway.

Price of book only.....\$2.00, net.

In ordering please state sizes of springs required.



# THE CRESCENT THERMOMETERS.

*Especially Adapted for Hot Water and Steam Heated Plants.*

These Instruments have been specially designed for the above purposes and have been applied with great success.

They are made with either White Silvered or Black Metal Dials, and are handsomely finished.

The cases are made detachable, so that the lower part forming the Mercury Bath can remain in apparatus while the upper part can be removed if this should become necessary for repairs.

The Steam Heater Thermometer is provided with Temperature and Pressure Scales.



Fig. 2.

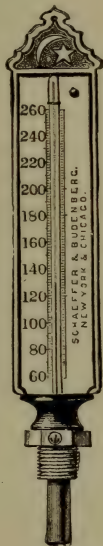


Fig. 1.

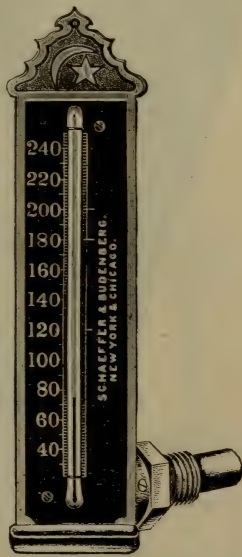
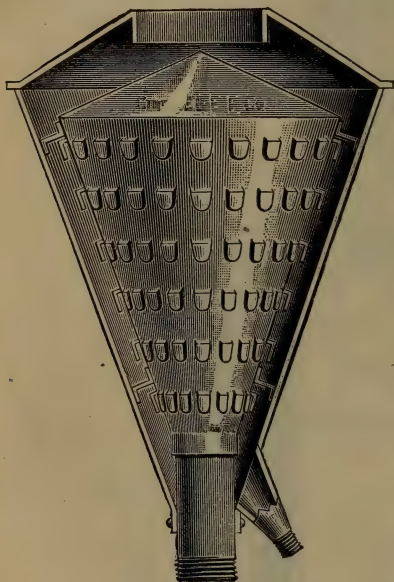


Fig. 3.

Fig. 1. The Straight Crescent Thermometer, for Hot Water.....	Per Doz. \$36.00
Fig. 2. The Straight Crescent Thermometer, for Steam, with Pressure Scale.....	39.00
Fig. 3. The Angle Crescent Thermometer, for Hot Water.....	42.00
Fig. 4. The Angle Crescent Thermometer, for Steam, with Pressure Scale.....	45.00

NOTE.—If desired with Red Spirit Column instead of Mercury, please mention when ordering.

## THE "CINCINNATI" EXHAUST HEAD.

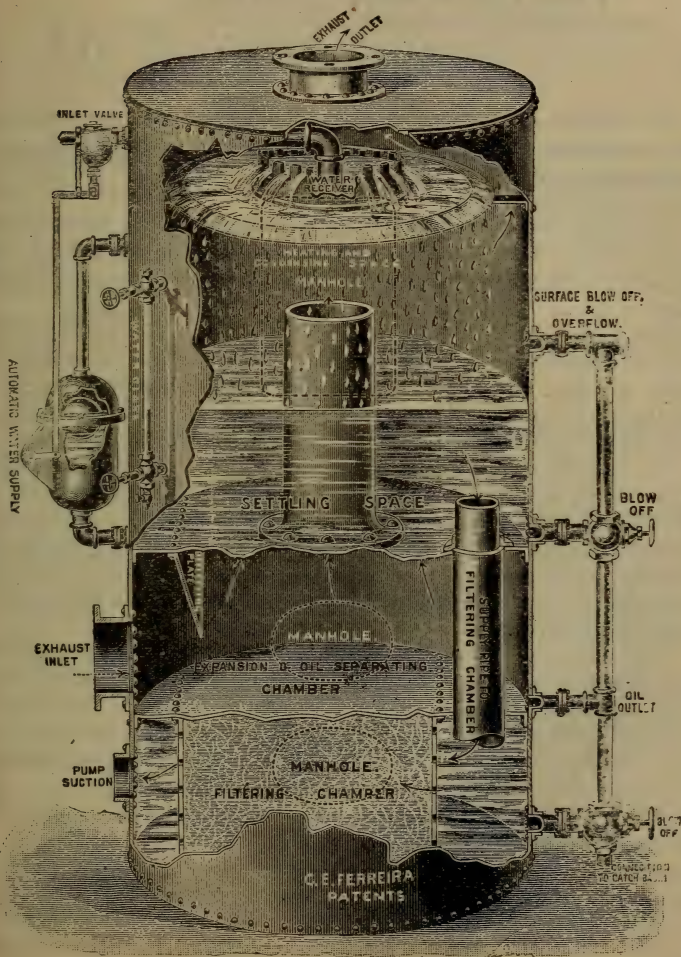


**H**ERE is an Exhaust Head built upon the simple principle of condensation by expansion. The area of the openings in the condensing chamber far exceeds the area of the exhaust pipe, thus rendering such a thing as back pressure impossible, while the condensing surface is comparatively large, and consequently just what is required for an efficient exhaust head. Steam leaves this head perfectly dry and free from condensation.

### Price List and Capacities:

Size of Exhaust Pipe.	Price.	Diameter of Drip Pipe.	Size of Exhaust Pipe.	Price.	Diameter of Drip Pipe.
1 or 1 $\frac{1}{2}$ in.	\$20 00	3 $\frac{3}{4}$ inch.	10 inch.	\$125 00	2 inch.
2 or 2 $\frac{1}{2}$ "	25 00	1 "	11 or 12 in.	150 00	2 "
3 or 3 $\frac{1}{2}$ "	30 00	1 "	13 inch.	175 00	2 $\frac{1}{2}$ "
4 or 4 $\frac{1}{2}$ "	40 00	1 "	14 "	200 00	2 $\frac{1}{2}$ "
5 inch.	50 00	1 $\frac{1}{4}$ "	15 "	235 00	3 "
6 "	60 00	1 $\frac{1}{2}$ "	16 "	250 00	3 "
7 "	75 00	1 $\frac{1}{4}$ "	17 "	270 00	3 $\frac{1}{2}$ "
8 "	90 00	1 $\frac{1}{2}$ "	18 "	300 00	3 $\frac{1}{2}$ "
9 "	105 00	1 $\frac{3}{4}$ "			

## EXCELSIOR HEATER.



# The Excelsior -- STYLE No. 1.

## DESCRIPTION.

The exhaust steam enters the expansion and oil separating chamber from any desired direction. The oil is separated from the steam by deflection and expansion, and flows to the sewer through the oil outlet, or can be arrested and saved.

The steam rises to the dome of the heater through the *tube* furnished for this purpose, here it mingles with the water and imparts to it all the heat possible, the surplus steam going to the atmosphere through exhaust outlet

The water enters at *inlet valve* and flows into the water *receiver* where it overflows on to distribution plate, *falling in a circle* around the *outside* of tube; the diameter of the distributing plate is much greater than the tube, consequently *no water* can enter heater without coming in *direct contact* with steam.

The current of the steam carries the water to sides of shell, down which it flows, leaving the water in the settling chamber *undisturbed*, so that those impurities which do not accumulate on the sides of shell, settle in settling chamber. The lighter impurities remain in suspension, and which can only be removed by filtering, are *arrested* in the *filtering chamber*, so that all the impurities released by the temperature that exhaust steam can impart, are *prevented* from entering the *boilers*.

The *steam tube* leading from the expansion chamber through the upper chamber, stands 16" above the working water line, and 6" above the precautionary overflow, making it *absolutely impossible* for the water to *overflow* into the *steam tube*. The upper and lower chambers are connected by means of a pipe passing through the expansion chamber. *Every part of each chamber can be reached through manholes*

The water is supplied automatically to the *receiver* in proportion as it is *drawn out* of the *heater*.

All Excelsiors are of *boiler construction* throughout. *Slip bolts* are used on all *manholes*, and the *cleaning door* is on *hinges*.

In the Excelsior there is *not* a single *removable part* and nothing to give out. All parts subject to natural wear and tear, such as valves, etc., are *exposed*. With ordinary care it will last a life-time.



## The Excelsior -- STYLE No. 2.

No Combined Feed Water Heater and Receiving Tank was ever used prior to nine years ago, when the "**Excelsior**" combination manufactured *under patents controlled by us* was first brought before the public. It was then opposed by some of the most prominent architects, steam fitters and experts, but as soon as its merits caused it to be adopted for the most modern buildings of this country, the tide turned and to the credit of a majority of its opposers, when they saw its successful operation, they invariably recommended its use.

Architects should specify the **Excelsior Combination** for heating systems because :

FIRST—It furnishes dry and clean steam absolutely free from oil for heating purposes.

SECOND—It is less complicated than any other, consequently less liable to get out of order.

THIRD—It represents the latest, best, most economical and simple methods for heating and purifying water, for distributing the steam, and for receiving the condensation.

Experts and engineers should advocate the **Excelsior** because of the fuel and water it saves, and on account of its simplicity, durability, its efficiency as a purifier, ease of cleaning, and operation, for the reason that every spot inside of it can be reached through manholes and because it meets any and all conditions and requirements of any steam plant.

## THE AMERICAN BERRYMAN FEED WATER HEATER AND PURIFIER.

### TABLE OF SIZES.

No. of Heater.	Horse Power.	Diam. of Body	Length of Shell	Size of Exhaust	Size of Feeds	Mud Blow	Scum Blow	Size of Safety	Weight
1	50	18	48	3	1	1	1	1	600
2	75	18	60	4	1 $\frac{1}{4}$	1	1	1 $\frac{1}{4}$	650
3	100	24	48	5	1 $\frac{1}{2}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	950
4	150	24	60	6	2	1 $\frac{1}{4}$	1 $\frac{1}{4}$	2	1100
5	200	30	60	7	2	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2	1830
6	250	30	72	8	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	1950
7	300	30	84	8	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	2100
8	400	36	72	9	3	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3	2800
9	500	38	78	10	3	1 $\frac{1}{2}$	1 $\frac{1}{2}$	3	3300
10	600	43	72	12	4	2	2	4	4300
11	800	43	84	12	4	2	2	4	4600
12	1000	48	90	14	5	2	2	5	5800
13	1200	48	102	14	5	2	2	5	6200
14	1500	56	108	18	5	2	2	5	8900



The AMERICAN BERRYMAN is particularly adapted for use in localities where the water is muddy or impregnated with lime, making a settling chamber and mud blow beneficial in the removal of these impurities. A surface scum blow is also provided, and the hot water outlet pipe extends sufficiently far down into the shell to allow scum to collect at the surface, where it may be blown off.

The use of U bends is a deservedly popular feature in the construction of the BERRYMAN HEATER, since this arrangement of tubes allows the use of expanded joints, without danger of leakages due to temperature changes.

These heaters are constructed with the utmost care, are thoroughly tested before leaving the factory, and are guaranteed to be free from defect in material and workmanship.

### IMPORTANT NOTICE.

In Ordering state Boiler Pressure. We cannot guarantee the heater against accident unless a safety valve is used.

## THE AMERICAN STANDARD FEED WATER HEATER.

Contains no joints inside of shell, to cause trouble by leaking.

Made of pure, seamless *Copper Coils*, *braced* solidly to special gun-metal fittings, and supported with our improved clamp stays. Expansion and contraction are taken care of.

No back pressure on Engine. No oil in boiler.

Will heat feed-water instantaneously.

All coils tested to 600 pounds pressure. Cannot be burst by feed pump.

Water in contact only with copper tubing. Nothing to rust out.

Guaranteed in every particular.

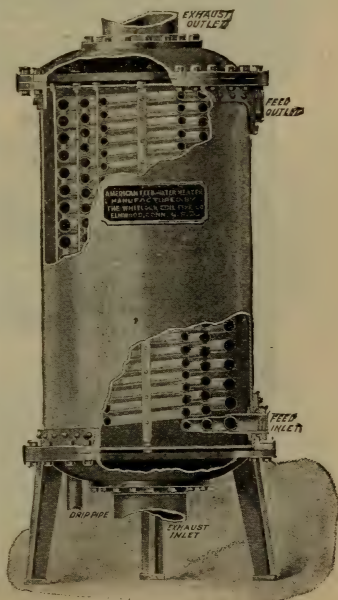
The most durable, effective and economical Heater produced.

Will reduce coal consumption 10 to 15 per cent.

Simple, strong and cheap.

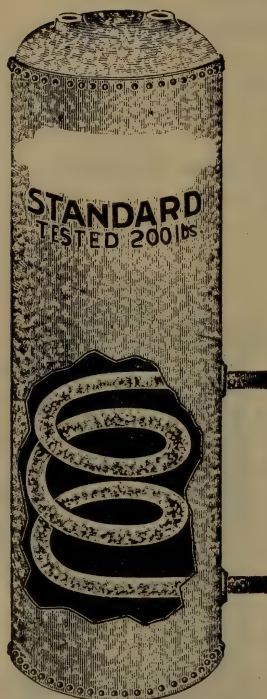
TABLE OF SIZES.

No. Heater	Horse Power	Weight	Length over all		Diameter of Flange	Size Exhaust	Size of Feed
			A	C		G	H
0	5	41	13	9		1½	1½
1	10	50	17	9		2	1½
2	15	85	17	12		2½	3¼
3	20	94	21	12		2½	3¼
4	25	234	25	18		3	1
5	30	270	29	18		3½	1
6	40	390	33	18		3½	1
7	50	450	37	20		4	1¼
8	60	500	40	20		4	1¼
9	80	540	45	20		5	1¼
10	100	630	50	20		5	1¼
11	125	810	45	24		6	1½
12	150	890	50	24		6	1½
13	200	1250	50	27		8	2
14	250	1450	55	27		8	2
15	300	1600	68	27		8	2
16	400	1750	65	34		10	2½
17	500	1900	70	34		10	2½
18	600	2400	80	38		12	3
19	800	3000	101	38		14	3
20	1000	3800	85	48		16	3½ or 4
21	1250	4600	100	48		16	3½ or 4
22	1500	5500	95	56		18	4
23	2000	7100	115	56		18	4
24	2500	8100	100	70		20	5
25	3000	9100	114	70		24	5



## SCAIFE' GALVANIZED BOILERS.

WITH SPIRAL COILS OF ONE INCH ANNEALED BRASS, COPPER  
OR GALVANIZED IRON PIPE.



TEST { 150 LBS.  
200 "  
400 "  
250 "  
300 "

Capacity.	Dimensions.
18 gals.	3 ft. by 12 in.
21 "	3½ " 12 "
24 "	4 " 12 "
24 "	3 " 14 "
27 "	4½ " 12 "
28 "	3½ " 14 "
30 "	5 " 12 "
32 "	4 " 14 "
35 "	5 " 13 "
36 "	6 " 12 "
36 "	4½ " 14 "
40 "	5 " 14 "
42 "	4 " 16 "
47 "	4½ " 16 "
48 "	6 " 14 "
52 "	5 " 16 "
53 "	4 " 18 "
63 "	6 " 16 "
66 "	5 " 18 "
79 "	6 " 18 "
82 "	5 " 20 "
98 "	6 " 20 "
100 "	5 " 22 "
120 "	6 " 22 "
120 "	5 " 24 "
144 "	6 " 24 "
168 "	7 " 24 "
192 "	8 " 24 "
240 "	10 " 24 "

Prices quoted on application.

### LARGE BOILERS WITH COILS.

Capacity.	Dimensions.
250 gals.	7 ft. by 12 in.
300 "	6 " 36 "
350 "	7 " 36 "
400 "	8 " 36 "
500 "	10 " 36 "
600 "	8 " 42 "
750 "	10 " 42 "
1,000 "	14 " 42 "

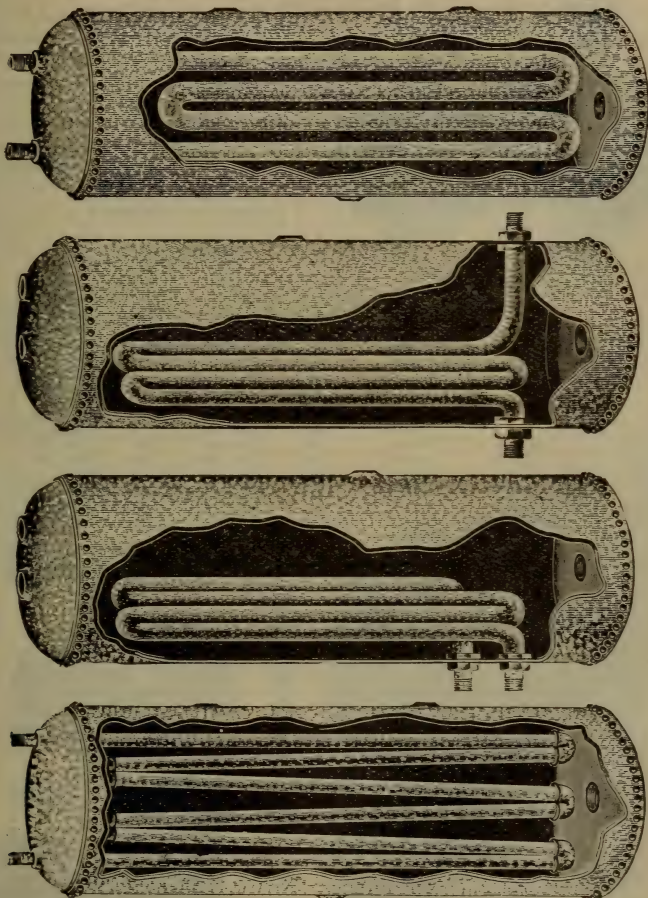
Prices quoted on application.

Tanks larger than 240 gals. capacity are usually not galvanized.  
Hand Holes furnished when desired.



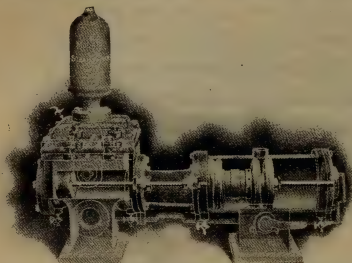
**HORIZONTAL AND UPRIGHT BOILERS.**

Galvanized and Painted, with Brass, Copper or Galvanized Iron Coils.



All sizes from 10 gals. to 1,000 gals. capacity. 75 lbs. to 300 lbs. pressure test.  
See pages 3, 7 and 8 for various sizes and dimensions.

## MOORE HIGH DUTY AND BOILER FEED PUMPS.



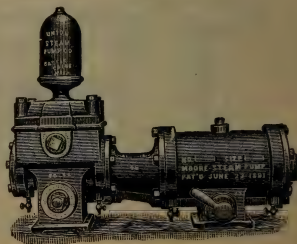
The pump which always goes when asked. No outside valve gear. Suitable for place where space is a consideration. Will not injure when suction is broken. Consumes the exhaust and returns it to boiler when handling cold water. Will run by air, steam or gas pressure. **This is the most popular small pump on the market—for any duty.** Following is a partial list of **high duty**.

Steam Cylinder.	Water Cylinder.	Stroke.	Capacity per Hour.	Supply Guaranteed.	Floor Space, Inches.	Shipping Weight.	List Price at Factory.	Extra for Hand Attachment
2½	1¾	2	200	20	4 x 15	40	\$ 30.00	\$5.00
3	1½	2½	350	35	5 x 19	60	50.00	6.50
3	1¾	3	500	50	6 x 21	75	60.00	7.50
3	2	3	550	55	6 x 21	75	65.00	7.50
4	2¾	4	700	70	8 x 25	160	75.00	8.00
5	2½	4	800	80	10 x 26	170	87.50	8.00
5	2¾	4	900	90	10 x 26	170	90.00	8.00
5	3	4	1000	100	10 x 26	170	100.00	8.00
5	3	6	1250	125	11 x 39	285	125.00	....
5½	3¼	7	1500	150	12 x 40	425	145.00	....
5½	3½	7	1760	175	12 x 40	425	160.00	....
6½	3¾	8	2044	200	13 x 42	480	175.00	....
6½	4	8	2580	250	13 x 43	480	200.00	....

## MOORE LOW DUTY AND TANK PUMPS.

These are made for low service where volume is to be considered. They are made for handling water, milk, air, gas, gasoline, volatile oils, acids, tar and thick stuffs. Vacuum and almost anything fluid. These are proof against the monkey wrench fiend.

Steam Cylinder.	Water Cylinder.	Stroke.	Capacity per Hour.	Floor Space, Inches.	Shipping Weight.	List Price at Factory
3	2	3	500	7 x 23	75	\$ 60.00
4	2¾	4	1109	8 x 28	160	85.00
4	3	4	1238	8 x 28	160	95.00
4	3½	4	1600	10 x 29	175	100.00
4	4	4	2089	10 x 29	175	105.00
5	3½	4	1919	10 x 29	190	110.00
5	4	4	2298	10 x 29	190	115.00
5	3½	6	2249	12 x 40	300	160.00
5	4	6	2937	12 x 40	325	170.00
5	4½	6	3700	13 x 41	325	180.00
5	5	6	4500	13 x 41	325	190.00
5½	4	7	3427	13 x 43	475	190.00
5½	4½	7	4337	13 x 43	475	200.00
5½	5	7	5353	13 x 43	500	210.00

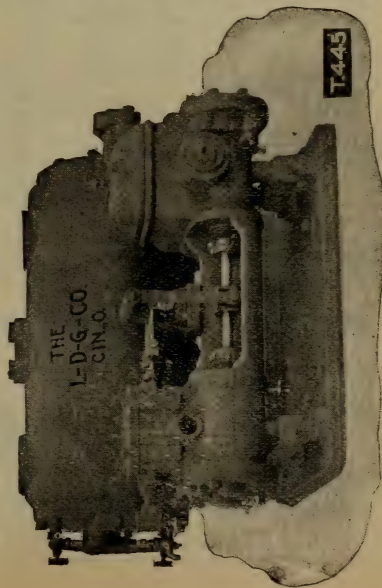


# STANDARD DUPLEX PISTON PUMPS.

Small Boiler Feed and High Service Pumps.



## AUTOMATIC PUMPS AND RECEIVERS.



Diameter of Steam Cylinders. Inches.	Diameter of Water Plungers. (Inches.)	Length of Stroke. (Inches.)	Proper Strokes per minute of ONE plunger, varying with kind of work and pressure.	U. S. Gallons delivered per minute by BOTH plungers at stated number of strokes.	Sizes of Pipes for Short Lengths. (Inches.)			
					Steam Pipe.	Exhaust Pipe.	Suction Pipe.	Discharge Pipe.
3 1/2	2 1/2	3	100 to 200	8 to 20	3/4	1/2	1 1/2	1
4 1/2	3 1/4	4	100 to 200	20 to 40	1	3/4	2	1 1/2
5 1/4	3 3/8	6	100 to 150	50 to 75	1 1/4	1 1/4	2 1/2	2
6	4	6	100 to 150	65 to 95	1 1/2	1 1/2	3	2 1/2
7 1/2	4 1/2	6	100 to 150	80 to 120	1 3/4	1 1/2	3 1/2	3
8	5	6	100 to 150	80 to 120	2	2	4	3
9	5 1/2	10	100 to 150	100 to 150	2 1/4	2 1/4	4 1/2	3 1/2
10	5 3/4	10	75 to 125	100 to 170	2 1/2	2 1/2	4 1/2	3 3/4
	5 1/2	10	75 to 125	140 to 220	2 3/4	2 3/4	4 3/4	3 3/4
		10	75 to 125	140 to 220	3	2 3/4	5	4

We show in cut No. T 445, our Automatic Pump and Receiver, for use in factories, hotels, apartment houses and other buildings where considerable steam is used for heating, and where it is always desirable and generally necessary to provide some apparatus for catching the condensation. The drainages of coils, radiators and steam lines fed back to boilers gives a good gain in economy. Much of the disagreeable snapping and hammering in heating pipes is due to the collection of water of condensation, and the outfit has been specially designed for use in such drainage service.

We give herewith the standard sizes. We can, however, supply low steam-pressure pumps wherever necessary, on which outfits we quote special sizes and prices.

Space occupied in Inches (Measurement over all.)			
Capacity in Gals. per min.	Sq're feet Radiating Surface	Length	Height
12	5,000	38	19
20	10,000	42	23
35	20,000	45	28
60	40,000	50	28

Size of Pumps. (Inches.)  
 3 1/2 x 2 x 3  
 4 1/2 x 2 3/4 x 4  
 5 1/4 x 3 1/2 x 6  
 6 x 4 x 6

T-445



## BURNHAM HIGH DUTY AND BOILER FEED PUMPS.

This is the **only Steam Pump** on the market having flat faced steam valves with outside tripping device which **will not injure from load to no load** without change of throttle. Will always start from any point of stop, and cannot short stroke.



Diam. of Steam Cylinder.	Diam. of Water Cylinder	L'ngth of Stroke.	Gals. per Hr. High-Speed	H. P. at Given Speed.	Price.	Diam. of Steam Cylinder.	Diam. of Water Cylinder	L'ngth of Stroke	Gals. per Hr. High-Speed	H. P. at Given Speed.	Price.
4	2½	5	960	45-90	\$100	12	7½	16	18300	900-1800	\$675
5	3	6	1600	75-150	150	14	7½	12	17000	850-1700	550
5½	3½	7	2640	100-200	200	14	8	12	19300	950-1900	575
6½	4	8	3960	150-300	225	14	8½	12	22000	1100-2200	600
7½	4¾	9	4000	200-400	250	14	8	16	20800	1000-2000	650
7½	4½	9	4500	225-450	275	14	8½	16	23500	1250-2300	675
8½	5	10	6300	300-600	325	14	9	16	26400	1300-2600	700
8½	5½	10	7700	350-700	350	16	8	16	20800	1000-2000	725
10	6	12	11000	500-1000	425	16	9	16	26400	1300-2600	735
10	6½	12	12900	600-1200	450	16	10	16	32600	1600-3200	750
12	7	12	14900	700-1400	475	18	10	16	32600	1600-3200	...
12	7½	12	17000	850-1700	500	18	12	16	47000	2350-4700	...
12	7	16	15500	750-1500	650	20	14	16	65000	3250-6500	...

## BURNHAM LOW DUTY AND TANK PUMPS.

Price.	Gals. per Hr., Highest Speed.	Length of Stroke.	Water Cylinder.	Steam Cylinder.
\$445	15600	12	8	8
500	10800	12	9	9
550	24000	12	8	8
565	12	12	11	11
575	29600	12	8	8
585	35000	12	12	12
500	15600	8	10	10
525	10800	9	10	10
535	12	10	10	10
545	24000	12	10	10
575	21000	12	10	10
590	29600	12	10	10
600	35000	12	10	10
625	15600	12	12	12
650	10800	9	12	12
675	24000	12	12	12
685	29600	12	12	12
700	35000	12	12	12
725	15600	16	16	16
750	10800	16	16	16
800	24000	12	14	14
700	12	12	14	14
775	24000	12	14	14
850	35000	16	16	16
725	15600	16	16	16
775	10800	16	16	16
800	24000	16	16	16
825	29600	16	16	16
850	35000	16	16	16
875	15600	16	16	16
.....	10800	16	16	16
.....	24000	20	20	20
.....	29600	20	20	20
.....	35000	20	20	20
.....	15600	18	18	18
.....	10800	18	18	18
.....	24000	20	20	20
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.....	35000	20	20	20
.....	15600	18	18	18
.....	10800	18	18	18
.....	24000	20	20	20
.....	29600	20	20	20</



## DEEP WELL STEAM PUMPING ENGINE.

WITH BRASS DISPLACEMENT PLUNGER.

These Engines are adapted for non-flowing, Artesian, tubular, bored, dug or driven wells. They are constructed so as to insure a steady flow of water, whether raised from shallow or deep wells, there being separate adjustments for the upward and downward strokes; therefore a perfect travel of piston is obtained, without regard to the weight of the reciprocating parts. The breaking of the pump poles, due to the sudden reversal motion, is avoided in our Deep Well Engines. Sight Feed Lubricator, Drain Cocks, Plugs and Spanner Wrench are furnished with each outfit.

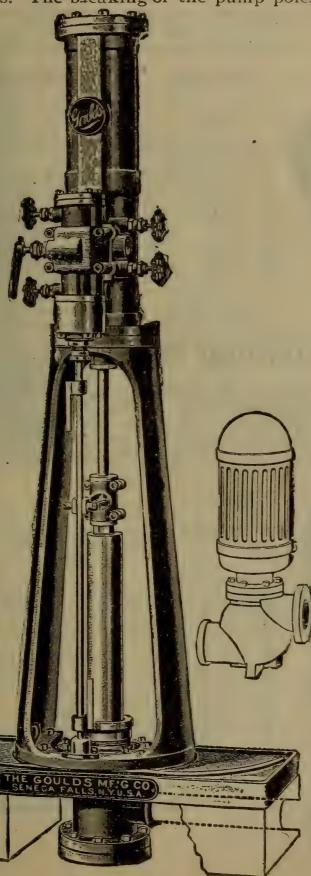


FIG. 1057. SIZES, PRICES, ETC.

Steam Cyl.		Steam Pipe	Exhaust Pipe	Steam end only
Dia.	Stroke			Price
5 in	24 in	3/4 in	1 in	\$225 00
5 "	36 "	3/4 "	1 "	250 00
6 "	24 "	1 "	1 1/4 "	250 00
6 "	36 "	1 "	1 1/4 "	300 00
7 "	24 "	1 1/4 "	1 1/2 "	300 00
7 "	36 "	1 1/4 "	1 1/2 "	315 00
8 "	24 "	1 1/2 "	1 3/4 "	315 00
8 "	36 "	1 1/2 "	1 3/4 "	325 00
9 "	24 "	1 3/4 "	2 "	325 00
9 "	36 "	1 3/4 "	2 "	350 00
10 "	24 "	2 "	2 "	350 00
10 "	36 "	2 "	2 "	375 00
11 "	24 "	2 1/2 "	2 1/2 "	415 00
11 "	36 "	2 1/2 "	2 1/2 "	450 00
12 "	24 "	2 1/2 "	2 1/2 "	450 00
12 "	36 "	2 1/2 "	2 1/2 "	500 00
14 "	24 "	2 1/2 "	2 1/2 "	675 00
14 "	36 "	2 1/2 "	2 1/2 "	750 00

## SIZES AND PRICES.

Combined Air Chamber and Discharge Check Valve.

Size Well	Size Check Valve	Price
3 in. and smaller	2 in	\$12 00
3 1/2 "	2 1/2 "	14 00
4 "	2 1/2 "	14 00
4 1/2 "	3 "	16 25
5 "	3 "	16 25
6 "	3 1/2 "	21 00
7 "	3 1/2 "	21 00
8 "	4 "	24 50
10 "	5 "	27 00

FIG. 1057

## “CHALLENGE” DOUBLE-ACTING POWER PUMP.

Fig. 824½ is a light service pump for filling tanks, circulating fluids of any kind maintaining vacuum, etc.

Substantial bed-plate. Machine-cut gear and pinion. Tight and loose pulleys. Bronze valves and seats. Cup leather-packed piston (metallic packed piston at extra price) and brass cased piston rod.

2½, 3 and 4-in. geared, 4 to 1 have 20 x 3 pulley.  
5 and 6-in. geared, 3 to 1 have 20 x 4 pulley.  
7 and 8-in. geared, 4 to 1 have 24 x 4 pulley.

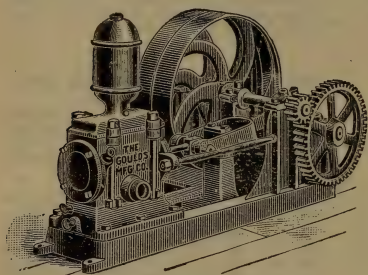


FIG. 824½

FIG. 824½. SIZES, CAPACITIES, ETC.

Piston		Suc.	Dis.	Brass Lined	Brass Cyl.	*All Brass
Dia	Str.					
2½ in	4½ in	1½ in	1 in	\$ 85.	\$115.	\$150.
3 "	4½ "	1½ "	1½ "	90.	120.	155.
4 "	4½ "	1½ "	1½ "	95.	130.	170.
5 "	5 "	2 "	1½ "	125.	175.	260.
6 "	5 "	2½ "	2 "	150.	220.	320.
7 "	6 "	3 "	3 "	250.	425.	550.
8 "	6 "	4 "	4 "	300.	500.	650.

\*All B rass Pumps have all parts of Brass, except the bed-plate and driving parts.

## TRIPLEX POWER PUMP.

Fig. 924. Iron base and cylinder. Flanged air chamber. Machine-cut gear and pinion. Tight and loose pulleys. Cast steel crank shaft. Rubber disc valves with bronze trimmings and seats. Outside packed plungers with water seal. Sight feed oil cups. Fitted with bronze plungers, glands and bronzed-lined cylinders, for pumping hot water, at extra price. In ordering state whether hot or cold water is to be pumped. Geared 5 to 1.

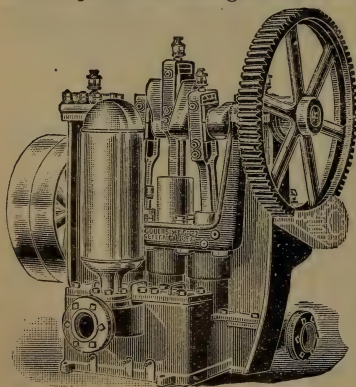


FIG. 924.

Plungers		Speed & Capacity per Min.		Suc. and Dis.	Tight and Loose Pul'ys
Dia	Stroke				
2½ in	4 in	50 Revs.—	12 Gals	1½ in	15x3
3 "	4 "	50 "	— 13 "	1½ "	15x3
4 "	4 "	45 "	— 21 "	2 "	20x3
4 "	6 "	45 "	— 41 "	2 "	20x3
5 "	6 "	45 "	— 67 "	3 "	26x4
5 "	8 "	41 "	— 80 "	3 "	30x5
6½ "	8 "	40 "	— 136 "	4 "	3"x6
8 "	8 "	40 "	— 208 "	5 "	3"x6
8 "	10 "	40 "	— 260 "	5 "	4"x6
9 "	10 "	40 "	— 328 "	6 "	42x8

Price Upon Application.

## PLUNGER, BOILER FEED PUMPS.

Fig. 292 represents our Power Boiler Feed Pump for supplying water against any pressure. The valve seats are made of best bronze and screwed into the iron castings, and can therefore be removed when worn out and new ones inserted. The valve itself is also of bronze. The stuffing-box, top of piston and stub end are finished bright and polished.

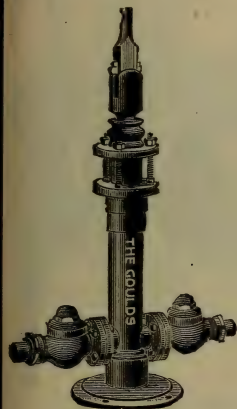


FIG. 292.

FIG. 292. SIZES, PRICES, ETC.

No.	Diameter Cylinder	Stroke	Capacity per Minute 60 Strokes	Suc. Dis	Price
00	1½ in	9 in	4.13 gal	1 in	\$70.00
0	2 in	9 in	7.45 "	1¼ in	85.00
2	2½ in	9 in	11.47 "	1½ in	40.00
4	3 in	9 in	15.52 "	1½ in	50.00

Iron base and standard supporting crank shaft with face plate and crank handle. Tight and loose pulleys. Iron cylinder. Trunk plunger working through stuffing box. Brass suction discharge check valves.

FIG. 484.

No.	Dia. Cyl.	Suc. and Dis.	Pulleys	Price
0	2 in	1 in	16x8	\$40.00
2	2½ in	1½ in	16x8	42.50
4	3 in	1½ in	16x8	45.00

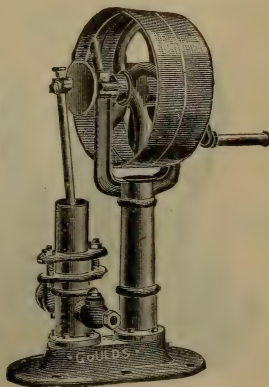


FIG. 484.

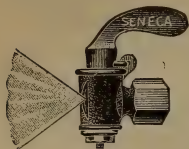


FIG. 81

**"SENECA" NOZZLE.**Fig. 81. For  $\frac{1}{4}$  inch pipe, \$1.00.For  $\frac{1}{2}$  inch hose coupling, \$1.25.**GEARED COUNTER SHAFT**FIG. 650 $\frac{1}{2}$ .

Fig. 650 $\frac{1}{2}$ . Geared Counter Shaft with plummer blocks, tight and loose pulleys, face plate. Connecting rod for driving Power Pumps.

No.	Stroke.	Pulleys	Geared	Price
1	10 in.	14x4	3 to 1	\$59.00
1A	12, 14 or 13	14x4	3 to 1	60.00

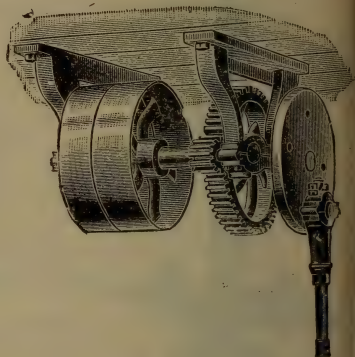
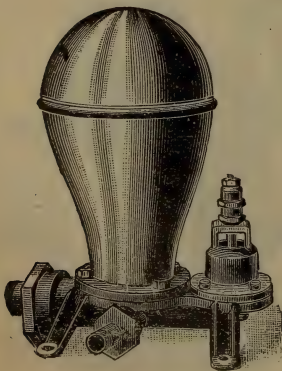
FIG. 650 $\frac{1}{2}$ 

FIG. 345

**IMPROVED HYDRAULIC RAMS**

Cast-iron base with drive and discharge pipe connections. Flanged iron air chamber. Brass impetus valve.

FIG. 345.

Size	Supply per Minute to Operate Ram.	Length of Drive Pipe Feet.	Pipes		Price
			Drive	Dis	
No. 2	1 to 2 gals.	50 to 75	$\frac{3}{4}$ in	$\frac{1}{2}$ in	\$ 9.00
" 3	2 " 4 "	50 " "	1 " "	$\frac{1}{2}$ " "	11 00
" 4	3 " 7 "	50 " 100	1 $\frac{1}{4}$ " "	$\frac{3}{4}$ " "	14.00

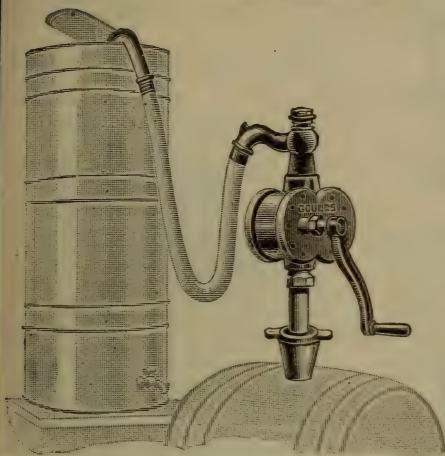
FIG. 345 $\frac{1}{2}$ .

No. 5	6 to 10 gals.	50 to 150	2 in	1 in	\$ 22.00
" 6	11 " 25 "	50 " 200	2 $\frac{1}{2}$ "	1 $\frac{1}{4}$ "	40 00
" 7	20 " 40 "	50 " 200	3 " "	1 $\frac{1}{2}$ "	75.00
" 8	25 " 75 "	50 " 200	4 " "	2 " "	125.00

Special Ram Circular sent upon Application.



## Rotary Barrel Pump.



Cams accurately planed to mesh and fit case perfectly. Cam shaft with crank and handle. Taper sleeve in two parts, fitting bungholes  $1\frac{1}{2}$  in. to 4 in. Price includes suction pipe, hose coupling and holder.

FIG. 464.

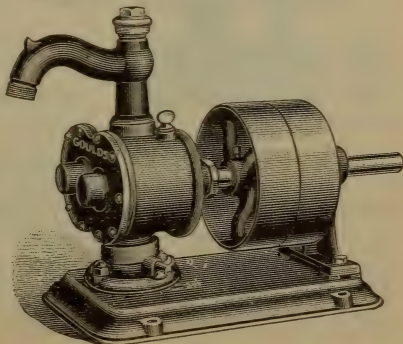
No.	Suc.	Dis.	Iron	Bronze Case & Cams	Bronze
1	1 in	1 in	\$17.00	\$39.00	\$49.00
2	1 " "	1 " "	20.00	44.00	54.00
3	1½ " "	1½ " "	24.00	49.00	61.00

## Power Rotary Force Pump.

Fig. 1185½ is mounted on base with tight and loose pulleys, otherwise is same construction as Fig. 297.

Bronze Pumps have all parts coming in contact with the liquid of Bronze.

FIG. 1185½



No.	Suc.	Dis.	Iron	Bronze Case & Cams	Bronze
1	1¼ in	1 in	\$27.00	\$49.00	\$60.00
2	1¼ " "	1 " "	32.00	56.00	65.00
3	1½ " "	1¼ " "	38.00	63.00	75.00
4	2 " "	1½ " "	48.00	78.00	100.00
5	2 " "	2 " "	54.00	90.00	120.00
6	2½ " "	2½ " "	80.00	135.00	175.00

### "THRESHER" DOUBLE ACTING FORCE PUMP.

Iron cylinder. Leather faced poppet valves. Solid piston, double crimped packed. Polished steel piston rod and brass gland. Detachable wood lever. Large and direct waterways. Price includes strainer and hose couplings.

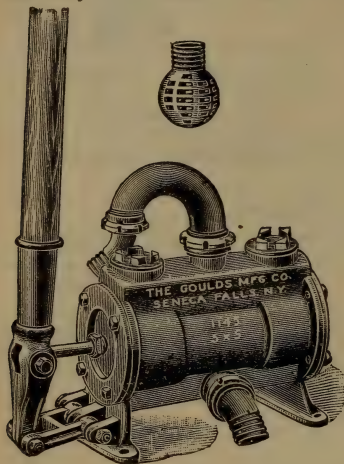


Fig 1-45	D.a.Cyl	Stroke	Suction *	Dis'cge *	Price
Pattern only	5 in.	5 in.	2 in. hose	1 in. hose	\$18.00
Outfit A	Fig. 1145. Thresher Tank Pump with 15 ft. 2-in. spiral wire suction hose 12½ ft. 1-in 3-ply discharge hose couplings. Suction basket and nozzle, all complete				40.00
Outfit B	Fig. 1145. Thresher Tank Pump with 20 ft. 2-in. spiral wire suction hose 12½ ft. 1-in 3-ply rubber discharge hose couplings, suction basket and nozzle, all complete.				45.00
Outfit C	Fig. 1145. Thresher Tank Pump with 25 ft. 2-in. spiral wire suction hose, 12½ ft. 1-in. 3-ply discharge hose, couplings, suction basket and nozzle, all complete.				50.00
Outfit D	Fig. 1145. Thresher Tank Pump with 25 ft. 2-in spiral wire suction hose, 25 ft. 1-in 3-ply discharge hose couplings, suction basket and nozzle, all complete.				54.00

\* When specially ordered we can fit suction 2-in. and discharge 1½-in. Iron Pipe without charge.

### "ALBANY" DOUBLE ACTING FORCE PUMP.

Long Vertical lever. Valves and Valve Seats brass. Brass cased piston rod. Piston cup leather packed. Ample air chamber. Stroke 5-inch.

FIG. 1255.

No.	Dia. Cyl.	Suction	Dis'chge	Iron	Brass Lined
4	3 in	1¼ in	1 in	\$18.00	\$21.00
8	4 "	1½ "	1¼ "	24.00	28.00
12	5 "	2 "	2 "	30.00	35.00

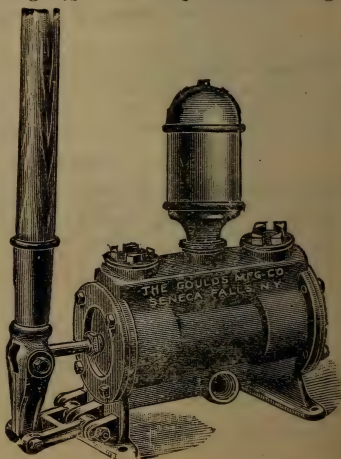


FIG. 1255.

## PUMPS.



The "Torrent" Thresher Tank Pump.

This Pump may also be used as a Bilge and Deck Pump on small vessels, or in any place where it is desired to remove water from, such as cellars, ditches, etc. It is durable and simple in construction, and is one of the easiest working Pumps ever made.

The "Torrent" may be used for cleaning out the boiler flues, also as a Fire-pump it will do good service. It is provided with an air chamber, which causes the discharge of a continuous stream of water. On a Thresher-wagon Tank it may be placed in any position that will allow the suction hose to reach the water.

No extension is necessary to the top of Tank, since the Suction Coupling projects beyond the base of the Pump.

## SIZES AND PRICES.

	Size Cylindr	Suction	Discharge	Stroke	Cap'ty per Stroke	Price.
Pump only	4 1/2 in.	for 2 in. hose	2 in. or 1 1/2 in. hose	4 in.	55 gal.	\$18 00
Outlet "A"	Pump complete with 15 ft. of 2 in. spiral-wire suction hose and strainer; 12 1/2 ft. of 1 in. 3-ply discharge hose and nozzle					\$40 00
Outlet "B"	Pump complete with 20 ft. of 2 in. spiral-wire suction hose and strainer; 12 1/2 ft. of 1 in. 3-ply discharge hose and nozzle					\$45 00
Outlet "C"	Pump complete with 25 ft. of 2 in. spiral-wire suction hose and strainer; 12 1/2 ft. of 1 in. 3-ply discharge hose and nozzle					\$50 00
Outlet "D"	Pump complete with 25 ft. of 2 in. spiral-wire suction hose and strainer; 25 feet of 1 in. 3-ply discharge hose and nozzle					\$54 00



Bottom Suction.

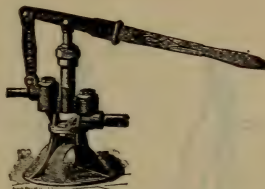


Side Suction.

## Marine Bilge Pumps.

The Pumps represented by the above cuts are adapted for raising large quantities of water by hand from the bilge well of vessels, from stone quarries and coal mines, cellars and ditches, and for irrigating purposes, where the water is not over 20 feet, vertically, from the Pump. They are much used by contractors in removing water from excavations of various kinds.

No.	Diam. of Cylinder	Plane for Inlet	Length of Stroke	Cap'ty per Stroke	Bot. Suct'n Side Suct'n	Price.	Price.
2	6 inches	3 in. pipe	4 inches	40 Gal.	27 00	32 00	35 00
4	8 1/2 "	4 "	6 "	147 "	36 00		



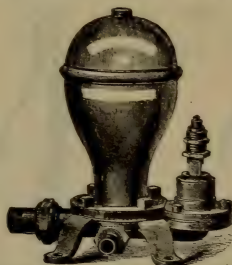
Boiler Test Pump.

The above cut represents our new Hydraulic Pressure Test Pump, for determining the pressure strength of Boilers, Pipes, Pump Cylinders, etc. With this Pump and a suitable Gauge, the pressure strength of Boilers, etc., can be tested up to 800 pounds to the square inch.

For the use of Plumbers in forcing out waste water pipes, this Pump would be invaluable. The Pump is furnished complete, as shown in cut, without Hydraulic Gauge, or with gauge as listed below.

The suction is fitted for 3/4 inch, and the discharge for 1/2 inch Pipe. The working parts of the "Little Giant" Test Pumps are made entirely of bronze.

N.B.—Every part of this Pump is constructed in the most substantial manner, so that greater pressure can be obtained by using a longer lever, which can be easily made of bar iron or steel, the lever socket being adapted for the change.



Hydraulic Ram, for Elevating Water.

The above cut represents the Deming Hydraulic Ram. In locating, a pit should be dug in which the Hydraulic Ram may be placed, in order that it be not affected by the frost. From the pit a drain should be arranged to carry off the waste water.

A Reservoir should be constructed, giving the greatest fall or head of water through the Drive Pipe to the Ram.

Our Rams are made of Iron and Bronze. The Valve Stem and Case of the Impetus or Waste Valve are always made of Bronze, which is the best material for the purpose.

No.	Quantity of water furnished by the Reservoir to which the Ram is adapted.	Length the Drive Pipe should be	CALIBRE OF PIPE.		Price
			Drive	Discharge	
2	1/2 to 2 gallons per minute	12 to 50 ft.	3/4 inch	1/2 inch	\$9 00
3	2 to 4 "	12 to 50 ft.	1 "	3/4 "	11 00
4	2 to 7 "	12 to 50 ft.	1 1/4 "	1 "	14 00
5	8 to 14 "	25 to 100 ft.	2 "	1 1/4 "	22 00
6	12 to 25 "	25 to 100 ft.	2 1/2 "	1 3/4 "	40 00
7	30 to 80 "	25 to 125 ft.	4 "	2 "	75 00
8	30 to 120 "	25 to 150 ft.	6 "	2 1/2 "	125 00

## PUMP STANDARDS.



No. 845.



No. 846.



No. 486.



No. 236.

No.	Stroke	Suction	Well Rod	*Lift	Price, each, \$
845	8 inch	1 inch Pipe	$\frac{3}{8}$ inch	$2\frac{1}{2}$ inch Cylinder, 40 feet	4 25
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	40 "	4 75
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	24 "	5 00
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	30 "	5 50
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	30 "	5 75
846	8 inch	1 inch Pipe	$\frac{3}{8}$ inch	$2\frac{1}{2}$ inch Cylinder, 40 feet	5 50
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	40 "	6 00
	6 "	$1\frac{1}{4}$ "	$\frac{3}{8}$ "	40 "	6 00
	Stroke	Suction	Well Rod	*Lift	
486	8 inch	$1\frac{1}{4}$ inch Pipe	$\frac{7}{8}$ inch	$2\frac{1}{2}$ inch Cylinder, 75 feet	6 00
	Stroke	Suction	Well Rod	*Lift	
236	7 inch	$1\frac{1}{4}$ inch Pipe	$\frac{7}{8}$ inch	$2\frac{1}{2}$ inch Cylinder, 100 feet	10 00
				60 "	

Always fitted  $1\frac{1}{4}$  inch, unless otherwise ordered.



No. 853.



No. 855.



No. 237.



No. 593.

No.	Stroke	Suction	Discharge	Well Rod	*Lift and Force	Price, each, \$
853	8 inch	$1\frac{1}{4}$ in. pipe	$1\frac{1}{4}$ in. Pipe and $\frac{3}{4}$ in. Hose	$\frac{7}{8}$ in.	$2\frac{1}{2}$ in. Cylinder, 60 feet	11 00
	Stroke	Suction	Discharge	Well Rod	*Lift	
855	8 inch	$1\frac{1}{4}$ in. pipe	$1\frac{1}{4}$ in. Pipe and $\frac{3}{4}$ in. Hose	$\frac{7}{8}$ in.	$2\frac{1}{2}$ in. Cylinder, 60 feet	11 00
	Stroke	Suction	Well Rod	*Lift		
237	7 inch	$1\frac{1}{4}$ in. Pipe	$1\frac{1}{4}$ in. Pipe, 1 in. Hose	$\frac{7}{8}$ in.	$2\frac{1}{2}$ in. Cylinder, 100 ft.	13 00
					80 ft.	
No. 237 has two supporting braces. It is made in two sections with flange between; is very heavy throughout, and can be fitted for any size pipe from $1\frac{1}{4}$ inch to $2\frac{1}{2}$ inch. Always fitted for $1\frac{1}{4}$ inch, unless otherwise ordered.						
593	1	7 inch	$1\frac{1}{4}$ in. Pipe and 1 in. Hose	$\frac{7}{8}$ in.	$2\frac{1}{2}$ in. Cylinder, 150 ft.	20 00
	2	Same as No. 1, with Cock Spout			100 ft.	22 50

No. 593 has two supporting braces and extra heavy balanced lever. It is made very heavy throughout and is therefore adapted for deep wells and hard duty.

†Not carried in stock.

\*Depth to which Pump may be adapted, with cylinders, size stated, placed within 15 or 20 feet of the water.

Cylinders are charged extra.



## PLAIN HORIZONTAL CENTRIFUGAL PUMP.

Fig. 3 Shows Plain Horizontal Centrifugal Pump. Is used where the water flows to pump, without suction, and discharge above.

### CAPACITY, PRICE LIST, ETC.

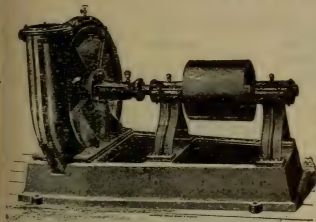


Fig. 3.

No. of Pump	Pipe Sizes of Flanges		Size of Pulley	Capacity in Gal. per Minute	PRICE	
	Dis-charge	Suc-tion			Iron	Brass
1½	1½	2	5 x 5	75	\$40.00	\$75.00
1¾	2	2	5 x 5	150	50.00	100.00
2	2	3	7 x 8	200	70.00	125.00
2½	2½	3	7 x 8	300	80.00	150.00
3	3	4	7 x 8	500	95.00	175.00
3½	3½	5	8 x 10	750	110.00	230.00
4	4	5	8 x 10	1,000	130.00	275.00
5	5	6	10 x 10	1,600	165.00	350.00
6	6	8	12 x 12	2,500	200.00	420.00
8	8	10	20 x 12	4,500	310.00	
10	10	12	24 x 12	7,000	400.00	
12	12	14	24 x 14	10,000	500.00	

## HORIZONTAL SUCTION CENTRIFUGAL PUMP.

Fig. 4 shows Horizontal Suction Centrifugal Pump, and is same as Fig. 3, with Suction Primer attached as shown at the left, and pipe extending not more than twenty-five feet, fill or prime the pump by using the primer as a hand pump, then start the Centrifugal and it will draw the water and force it where required.

### CAPACITY, PRICE LIST, ETC.

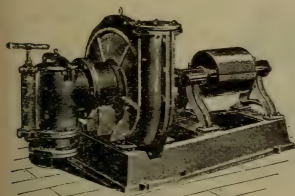


Fig.

No. of Pump	Pipe Sizes of Flanges		Size of Pulley	Capacity in Gals. per Minute	PRICE	
	Dis-charge	Suc-tion			Iron	Brass
1½	1½	2	5 x 5	75	\$50.00	\$85.00
1¾	2	2	5 x 5	150	60.00	120.00
2	2	3	7 x 8	200	85.00	150.00
2½	2½	3	7 x 8	300	95.00	175.00
3	3	4	7 x 8	500	115.00	210.00
3½	3½	5	8 x 10	750	135.00	270.00
4	4	5	8 x 10	1,000	155.00	330.00
5	5	6	10 x 10	1,600	195.00	420.00
6	6	8	12 x 12	2,500	240.00	500.00
8	8	10	20 x 12	4,500	375.00	
10	10	12	24 x 12	7,000		
12	12	14	24 x 14	10,000		

We make Primer for No. 8, but advise H. D. Steam Ejectors for priming any pump larger than No. 6.

## PLAIN VERTICAL CENTRIFUGAL PUMP.

Fig. 2 shows Plain Vertical Centrifugal Pump, and is placed at bottom of pit, well or stream completely submerged, with shaft extending above to connect to power. Is very simple and cheap.

### CAPACITY, PRICE LIST, ETC.



Fig. 2.

No. of Pump	Size of Pulley	Capacity in Gals per Minute	PRICE	
			Iron	Brass
1½	5 x 5	75	\$ 30.00	\$ 55.00
1¾	5 x 5	150	40 00	90.00
2	7 x 8	200	60 00	110.00
2½	7 x 8	300	70 00	135.00
3	7 x 8	500	75 00	150.00
3½	8 x 10	750	95.00	200.00
4	8 x 10	1,000	110.00	240.00
5	10 x 10	1,600	140 00	315.00
6	12 x 12	2,500	170.00	360.00
8	20 x 12	4,500	265 00	
10	24 x 12	7,000	330.00	
12	24 x 14	10,000	420.00	

## DOUBLE SUCTION VERTICAL CENTRIFUGAL PUMP.

Fig. 5 represents Double Suction Vertical Centrifugal Pump. The suction can be taken at either the side or bottom. Can be used same as Fig. 2, or with foot valve and suction pipe can be used as a suction pump. The water is received and discharged on both sides of piston, thus relieving the end thrust on step and runs more easily.

### CAPACITY, PRICE LIST, ETC.



Fig. 5.

No. of Pump	Pipe Size of Flanges.		Size of Pulley	Capacity in Gals. per Minute	Price
	Discharge	Suction			
1½	1½	2	5 x 5	75	\$ 40.00
1¾	2	2	5 x 5	150	50.00
2	2	3	7 x 8	200	75.00
2½	2½	3	7 x 8	300	85.00
3	3	4	7 x 8	500	95.00
4	4	5	8 x 10	1,000	130.00
5	5	6	10 x 10	1,600	160.00
6	6	8	12 x 12	2,500	200.00
8	8	10	20 x 12	4,500	300.00
10	10	12	24 x 12	7,000	390.00
12	12	14	24 x 14	10,000	500.00

Price of Brass Pump of this style on application.

## DOUBLE SUCTION HORIZONTAL CENTRIFUGAL PUMP.

Fig. 6 represents Double Suction Horizontal Centrifugal Pump and is used same as Fig. 3, or by attaching Primer can be used same as Fig. 4. The suction or primer can be attached at either side or back of pump. The piston receives and discharges on both sides, avoiding any end thrusts, and runs much easier and for a high lift is very much superior.

### CAPACITY, PRICE LIST, ETC.

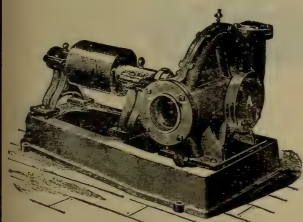


Fig. 6.

No. of Pump	Pipe Sizes of Flanges		Size of Pulley	Capacity in Gals. per Minute	PRICE	
	Dis-charge	Suction			Plain	With Primer
1½	1½	2	5 x 5	75	\$60.00	\$70.00
2¼	2	2	5 x 5	150	75.00	85.00
2	2	3	7 x 8	200	85.00	100.00
2½	2½	3	7 x 8	300	95.00	110.00
3	3	4	7 x 8	500	110.00	130.00
4	4	5	8 x 10	1,000	165.00	190.00
5	5	6	10 x 10	1,600	220.00	250.00
6	6	8	12 x 12	2,500	300.00	340.00
8	8	10	20 x 12	4,500	450.00	515.00
10	10	12	24 x 12	7,000	650.00	
12	12	14	24 x 14	10,000	900.00	

Price of Brass Pumps upon application.

## STEAM CENTRIFUGAL PUMP.

Fig 8 shows Steam Centrifugal Pump. It is a horizontal pump with a high speed Steam Engine attached direct to pump. Is very convenient where other power cannot be utilized, or where a boiler is in use and no engine. Is very compact and simple.

### CAPACITY, PRICE LIST, ETC.

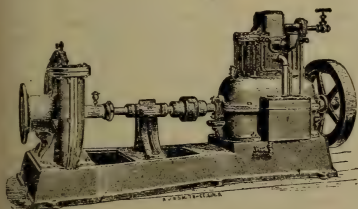


Fig. 8.

#### WITH BRASS PUMPS.

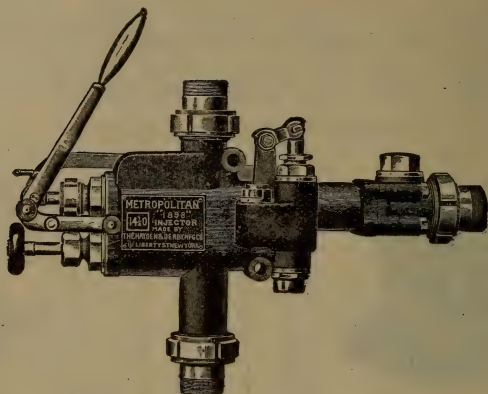
No. of Pump	Gallons per minute Capacity	Price to lift 25 ft. without primer not geared	Price to lift 25 ft. with primer not geared
2	200	\$275	\$290
2½	300	300	315
3	400	350	370
4	900	590	640

#### WITH IRON PUMPS.

No. of Pump	Gallons per minute Capacity	Price to lift 25 ft. without primer not geared	Price to lift 25 ft. with primer not geared
2	200	\$215	\$240
2½	300	230	260
3	400	275	295
4	900	450	500
5	1,400	550	600
6	2,000	800	850

Special price on larger sizes upon application.

## THE METROPOLITAN "1898" INJECTOR.



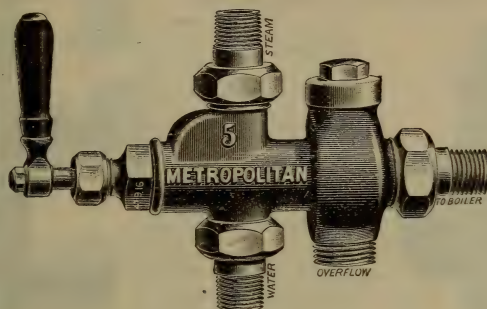
## PRICES.

Sizes	Prices Model O.	Sizes of all Pipe Connect'ns	Size Over-flow or Waste Pipe.	Capacity per Hour with 100 lbs. Steam Pressure.	Capacity per Hour with 175 lbs. Steam Pressure.	Horse power for the Ordinary Type of Boiler and Engine.	Horse-power on a basis of 30 lbs. Evaporation per H. P. per Hour.
7½	\$40.00	1 in.	¾ in.	525 gals.	600 gals.	45 to 65	55 to 80
8½	45.00	1 "	¾ "	625 "	720 "	65 to 80	80 to 110
9½	55.00	1¼ "	1 "	835 "	950 "	80 to 100	110 to 145
10½	60.00	1¼ "	1 "	1,040 "	1,195 "	100 to 130	145 to 180
11½	75.00	1½ "	1¼ "	1,350 "	1,550 "	130 to 170	180 to 235
12½	90.00	1½ "	1¼ "	1,800 "	2,070 "	170 to 230	235 to 300
13½	110.00	2 "	1½ "	2,350 "	2,675 "	230 to 300	300 to 400
14½	125.00	2 "	1½ "	2,900 "	3,275 "	300 to 375	400 to 500
15½	150.00	2½ "	2 "	3,600 "	3,975 "	375 to 500	500 to 650
16½	200.00	2½ "	2 "	4,300 "	4,750 "	500 to 650	650 to 800

The Metropolitan 1898 Injector will work with steam pressures from 25 to 300 lbs. without adjustment, when used with cold feed water and on a short lift. This Injector will also take feed water at 145 degrees Fahr with steam pressures from 35 to 140 lbs. When the exact conditions or steam pressure, temperature of feed water and location of water supply is known, special Metropolitan 1898 Injectors can be had which will work with lower and higher steam pressures.



## THE METROPOLITAN AUTOMATIC INJECTOR.



## PRICE LIST.

Sizes.	Prices Model N.	Size of all Pipe Connections.	Size Over-flow or Waste Pipe.	Capacity with 80 lbs. Steam Pressure, 2-ft. Lift.	Horse Power for the Ordinary Type of Boiler and Engine.	Horse Power on a Basis of 30 lbs. Evaporations per H. P. per Hour.
2	\$15.00	$\frac{3}{8}$	$\frac{3}{4}$	60 gals.	4 to 6	5 to 8
3	16.00	$\frac{3}{8}$	$\frac{3}{4}$	80 "	6 to 8	8 to 12
3 $\frac{1}{2}$	18.00	$\frac{1}{2}$	$\frac{3}{4}$	120 "	8 to 15	12 to 20
4	20.00	$\frac{1}{4}$	$\frac{3}{4}$	165 "	15 to 20	20 to 28
5	25.00	$\frac{3}{4}$	I	250 "	20 to 30	28 to 40
6	30.00	$\frac{3}{4}$	I	350 "	30 to 45	40 to 55
7	40.00	I	1 $\frac{1}{4}$	500 "	45 to 65	55 to 80
8	45.00	I	1 $\frac{1}{4}$	600 "	65 to 80	80 to 110
9	55.00	1 $\frac{1}{4}$	1 $\frac{1}{2}$	800 "	80 to 100	110 to 145
10	60.00	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1000 "	100 to 130	145 to 180
11	75.00	1 $\frac{1}{2}$	2	1300 "	130 to 170	180 to 235
12	90.00	1 $\frac{1}{2}$	2	1750 "	170 to 230	235 to 300
13	110.00	2	2 $\frac{1}{2}$	2300 "	230 to 300	300 to 400
14	125.00	2	2 $\frac{1}{2}$	2850 "	300 to 375	400 to 500

The Metropolitan Automatic Injector will work with steam pressures from 25 to 150 lbs. on a short lift and with cold feed water. If the lift is increased or the feed water heated the range of the Injector is correspondingly decreased. For hot feed water, high steam pressures and long lifts, the Metropolitan 1898 Injector, Model "O" should be used.

## LUNKENHEIMER AUTOMATIC INJECTOR.

For Boilers of Stationary, Portable or Traction Engines, Steamboats, Etc.



The Lunkenheim Automatic Injector is a simple, durable and efficient boiler feeder, not liable to get out of order, and fully guaranteed in every particular. It is warranted to give in actual service as good, if not better, results than are herein claimed for it. It will satisfy the most exacting engineer, as it will be found in practice to be reliably automatic under all ordinary conditions, have full capacity at higher steam pressures than others, not affected to any extent by varying steam pressures and the maximum amount of water delivered is capable of being graded over 50 per cent.

Attention is called to its excellence of design and simplicity of construction. The areas of the body are ample and the tubes all screwed in place, instead of de-

pending upon the pipe unions to secure them. These injectors are all carefully tested before shipment, and besides being required to deliver their rated capacities they must also be perfect in other respects. They will operate under the following range of steam pressure and lifts with the feed water at 75 degrees:

Lifts 2 to 4 feet, at steam pressures 20 to 180.  
Lifts 4 to 8 feet, at steam pressures 25 to 165.  
Lifts 8 to 12 feet, at steam pressures 30 to 140.  
Lifts 12 to 16 feet, at steam pressures 50 to 120.  
Lifts 16 to 18 feet, at steam pressures 60 to 100.  
Lifts 18 to 20 feet, at steam pressures 70 to 90.

With steam pressures from 60 to 100 and feed water at 75° F. the capacity of this injector can be graded over 50 per cent. Please bear in mind the fact that the above table is based on using the feed water at 75° F. With colder feed water much better results can be secured on many points of working. When lifting three feet this injector will handle hot feed water under the following conditions:

Feed water 100° F., at steam pressures from 30 to 145.  
Feed water 105° F., at steam pressures from 35 to 130.  
Feed water 120° F., at steam pressures from 40 to 115.  
Feed water 125° F., at steam pressures from 45 to 100.

### HOW TO CONNECT.

This cut will give a general idea of how to properly connect a Lunkenheim Automatic Injector to the boiler. With each machine is sent a complete direction card, which should be carefully read by the user. A new Lunkenheim Automatic Injector, if properly connected, will show in service all that is claimed for it herein.

Size No.	2	2½	3	3½	4	4½	5	6	7	8	9	10
All Pipe Connections.....Inches	½	¾	¾	¾	1	1	1½	1½	1½	1½	2	2
List Price.....Each	18.00	20.00	25.00	30.00	40.00	45.00	55.00	60.00	75.00	90.00	110.00	125.00

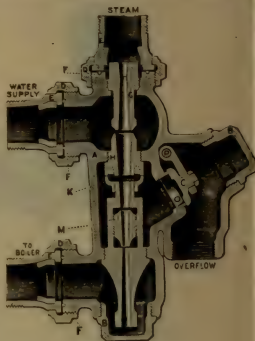
#### \*Gallons per Hour:

Maximum—75 lbs. Pressure..	117	162	235	330	440	550	740	920	1300	1710	2265	2860
Maximum—85 lbs. Pressure..	124	171	247	360	456	580	750	940	1320	1740	2290	2900
Maximum—95 lbs. Pressure..	130	180	260	385	480	600	760	960	1350	1780	2340	2950
Minimum—95 lbs. Pressure..	65	88	122	142	195	225	275	450	620	850	1050	1400

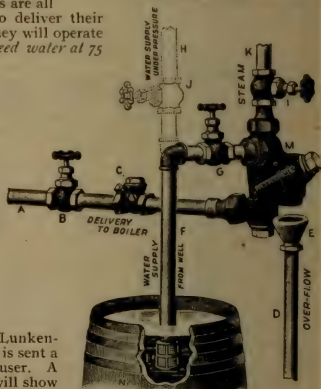
Suitable for Throttling Engines—Horse Power: Size No. 2, 10 to 15; 2½, 15 to 20; 3, 20 to 30; 3½, 30 to 45; 4, 45 to 65; 4½, 65 to 90; 5, 90 to 120; 6, 120 to 140; 7, 140 to 175; 8, 175 to 240; 9, 240 to 300; 10, 300 to 375.

\* Feed Water, 75° F.; Lift, 3 feet. Steam Pressure, 75, 85 and 95 lbs.

Where injectors are ordered by the size of pipe connections, we always ship the size having largest capacity. The capacities given above are guaranteed to have been taken from actual working tests and are not estimated.



Sectional View.



## REPAIRS.

The only parts subject to severe wear are those printed in heavy type.

A—Body of Injector.  
B—Overflow or Delivery Caps  
(Interchangeable).  
C—Overflow Valve.  
D—Union Ring.  
E—Union Tailpiece.  
F—Union Gasket.

G—Steam Tube.  
H—Water-Lifting Tube.  
K—Automatic Valve.  
M—Combining and Delivery  
Tubes.  
O—Overflow Valve Seat.  
P—Overflow Valve Pin.

In filling orders for repairs, where part *M* is ordered, part *K* is always included. With each machine is furnished a wrench for removing the water-lifting tube (*H*), but if it is lost any mechanic can make a new one by filing a slot in one end of a suitable-sized piece of gaspipe. The steam tube (*G*) and combining and delivery tubes (*M*) are provided with square end extensions which protrude beyond the body of the machine. This makes it possible to remove these tubes with an ordinary monkey wrench.

Size Number of Injector.....	2	2½	3	3½	4	4½	5	6	7	8	9	10
G—Steam Tube.....	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.95
H—Water-Lifting Tube.....	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.95
K—Automatic Valve.....	.10	.10	.15	.15	.15	.15	.20	.20	.20	.20	.25	.25
M—Combining and Delivery Tubes.....	1.40	1.60	1.90	2.00	2.40	2.50	2.80	3.00	3.70	4.20	5.00	5.90
F—Union Gasket.....	.05	.05	.05	.05	.05	.05	.05	.05	.10	.10	.10	.10
C—Overflow Valve.....	.40	.40	.50	.50	.60	.60	.75	.75	.80	.80	.90	.90
B—Cap (Overflow or Delivery).....	.40	.40	.50	.50	.60	.60	.70	.70	.80	.80	.90	.90
E and D—(Union Complete).....	.60	.60	.60	.60	.80	.80	1.00	1.00	1.40	1.40	1.90	1.90
O—Overflow Valve Seat.....	.10	.10	.10	.10	.15	.15	.15	.15	.20	.20	.20	.20
Tube Wrench.....	.60	.60	.60	.60	.60	.60	.70	.70	.80	.80	1.00	1.00
Funnels for Overflow.....	1.20	1.20	1.20	1.20	1.50	1.50	2.00	2.00	2.90	2.90	4.00	4.00

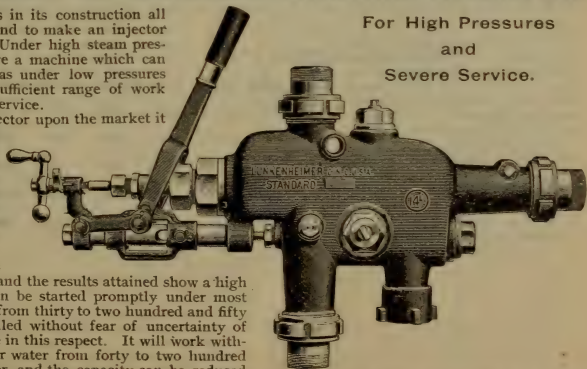
## LUNKENHEIMER '99 MODEL STANDARD INJECTOR.

This injector embodies in its construction all desirable features which tend to make an injector high grade and efficient. Under high steam pressures it is necessary to have a machine which can be operated as efficiently as under low pressures and one which admits of sufficient range of work to cover all conditions of service.

Before placing this injector upon the market it has been tested under a variety of conditions of severe service, and from the results of such tests, we are able to guarantee this machine to be superior in efficiency and durability to any other of its class on the market.

The construction is simple, manipulation easy and the results attained show a high degree of efficiency. It can be started promptly under most conditions, at all pressures from thirty to two hundred and fifty pounds, and can be handled without fear of uncertainty of action, as it is not sensitive in this respect. It will work without adjustment of steam or water from forty to two hundred and fifty pounds and higher, and the capacity can be reduced over fifty per cent. at all points. This feature makes it especially suitable for severe service, such as is found on railroads, steamboats and high-pressure power plants, and in other places where the load varies and it is necessary to have an injector in which the capacity can be reduced within wide limits.

For High Pressures  
and  
Severe Service.



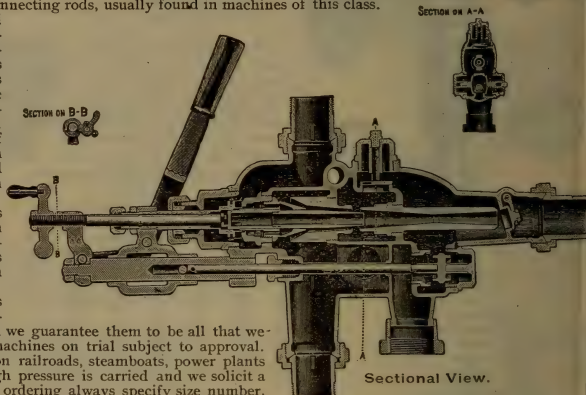
## LUNKENHEIMER '99 MODEL STANDARD INJECTOR—Continued.

The design of the machine is excellent, the parts are well proportioned, the operating mechanism which controls the steam and overflow valves is not complicated and is all contained within the body of the injector, and there are no outside connecting rods, usually found in machines of this class.

All valves are so placed that they are readily accessible for examination or repairs, the body casting is in one piece and the tubes can be removed from one end with the wrenches furnished with the machine. The line check valve is of the swing pattern, which gives full waterway, and when worn in the seat can be easily reground.

The table of capacities given below is based upon actual results and is not estimated, and the machines are guaranteed to conform to it in every respect.

With each machine is sent full directions for attaching and operating and we guarantee them to be all that we claim. We will furnish machines on trial subject to approval. Many of them are in use on railroads, steamboats, power plants and other places where high pressure is carried and we solicit a trial of this machine. In ordering always specify size number, and, if possible, state where the injector is to be used—whether for railroad, stationary or marine work. We issue a separate descriptive catalogue of this injector and same will be furnished upon application.



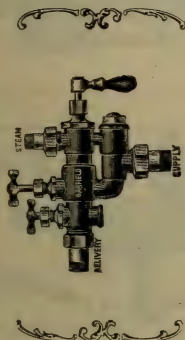
Size No. ....	8½	9½	10½	11½	12½	13½	14½	15	15½	16½
Pipe Connections Steam Suction	¾	1	1¼	1¼	1½	2	2	2	2	2½
Delivery.....Inches	¾	1	1¼	1¼	1½	2	2	2	2	2½
Pipe Connections Overflow, Inches	¾	¾	1	1	1¼	1½	1½	1½	1½	2
Price.....Each	50.00	60.00	75.00	90.00	110.00	125.00	140.00	150.00	160.00	190.00
*Maximum Capacities at Various Steam Pressures.....125 lbs.	650	835	1110	1485	1865	2320	2780	3430	3820	4640
*Maximum Capacities at Various Steam Pressures.....150 lbs.	665	855	1140	1520	1910	2375	2850	3518	3910	4760
*Maximum Capacities at Various Steam Pressures.....175 lbs.	682	876	1170	1560	1950	2440	2925	3610	4000	4875
*Maximum Capacities at Various Steam Pressures.....200 lbs.	700	900	1200	1600	2000	2500	3000	3700	4100	5000
*Maximum Capacities at Various Steam Pressures.....225 lbs.	715	925	1230	1640	2050	2560	3080	3795	4200	5130

\* Feed Water, 76° F. Lift, 5 feet.



# The Garfield Double Jet Injector.

## PRICE LIST.



No. of Injector.	Size of Connections.		Eighty Pounds Steam Pressure.		PRICE.
	Steam	Supply and Delivery.	Gals. Per Hour.	Horse Power.	
00	$\frac{3}{8}$	$\frac{3}{8}$	60	2 " 5	\$ 16 00
0	$\frac{3}{8}$	$\frac{1}{2}$	90	5 " 10	18 00
1	$\frac{3}{8}$	$\frac{1}{2}$	120	10 " 15	20 00
2	$\frac{1}{2}$	$\frac{3}{4}$	220	15 " 24	25 00
3	$\frac{1}{2}$	$\frac{3}{4}$	300	24 " 35	30 00
4	$\frac{3}{4}$	1	420	35 " 50	40 00
5	$\frac{3}{4}$	1	540	50 " 65	45 00
6	1	$1\frac{1}{4}$	720	65 " 90	55 00
7	$1\frac{1}{4}$	$1\frac{1}{4}$	900	90 " 115	60 00
8	$1\frac{1}{4}$	$1\frac{1}{2}$	1200	115 " 150	75 00
9	$1\frac{1}{4}$	$1\frac{1}{2}$	1700	150 " 200	90 00
10	$1\frac{1}{2}$	2	2200	200 " 275	110 00
11	$1\frac{1}{2}$	2	2800	275 " 350	125 00
12	2	$2\frac{1}{2}$	3400	350 " 425	150 00
13	2	$2\frac{1}{2}$	4000	425 " 500	180 00
14	2	$2\frac{1}{2}$	4500	500 " 600	200 00

# The Ohio Automatic Injector.

## PRICE LIST

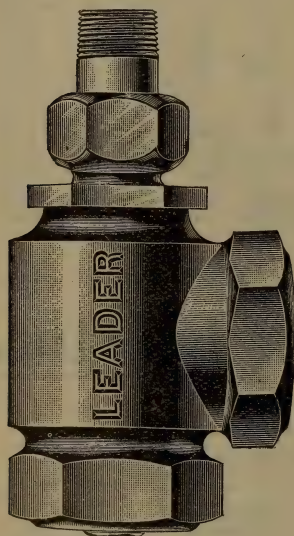
AND TABLE OF CAPACITIES, ETC.



SIZE	Pipe Connections	Capacity Per Hour	Horse Power	PRICE
0	$\frac{1}{2}$ in	120 gals	8 to 10	\$18 00
.1	$\frac{1}{2}$ in	165 "	10 " 15	20 00
2	$\frac{3}{4}$ in	250 "	15 " 25	25 00
3	$\frac{3}{4}$ in	340 "	25 " 35	30 00
4	1 in	460 "	35 " 60	40 00
5	1 in	580 "	40 " 75	45 00

## THE LEADER INJECTOR AND JET PUMP

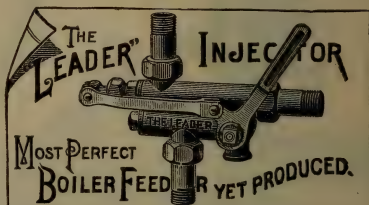
Is just what steam users are looking for. We guarantee every one to give satisfaction, or money refunded.



PRICE LIST.

No.	Gals. per hour.	
1	900	\$6 00
2	1200	8 00
3	1800	10 00
4	2000	12 00

When a man has use for a Jet Pump, he wants one that will bring water when steam is turned on. Our LEADER will do this every time.



PRICE LIST.

No. of Injector	Size of Pipes		Horse Power of Boiler. Will Feed	Gals. per hour. 60 lbs. sq' m	List Price
	Steam Pipe	Suct'n & Feed			
1	3/8	3/8	3 to 7	60	\$16 00
2	3/8	3/8	7 to 10	90	18 00
3	1/2	1/2	12 to 18	150	22 00
4	1/2	1/2	18 to 25	220	25 00
5	3/4	3/4	25 to 35	300	30 00
6	3/4	3/4	35 to 45	400	35 00
7	3/4	1	45 to 60	500	40 00
8	3/4	1	60 to 70	600	45 00
9	1	1 1/4	70 to 90	750	55 00
10	1	1 1/4	100 to 125	1000	65 00
11	1 1/4	1 1/2	125 to 150	1300	75 00
12	1 1/4	1 1/2	150 to 200	1800	90 00

### WHEN ORDERING AN INJECTOR, PLEASE STATE

FIRST—The horse power of your boiler and engine.

SECOND—Give steam pressure carried.

THIRD—If water is taken under pressure or lift.

FOURTH—If water is to be lifted give the lift or distance from the Injector to the water supply, both vertically and horizontally.

In ordering repairs, please give the stock number.

EVERY INJECTOR FULLY TESTED  
BEFORE SHIPMENT.

MODEL "C."



The H-D Ejectors, Models "C" and "P" will perform the same duty, the difference being in the form of the Ejector and the connections, the model "C" having union connections on both steam and delivery ends, and the model "P" having union connection on the steam end only.

PRICES, MODEL "C."

Sizes,	Prices Model C.	Pipe Connections.		Capacity per Hour with 50 lbs. Steam Pressure.
		Steam.	Suction and Delivery.	
No. 1 Brass	\$8.00	$\frac{3}{8}$	$\frac{1}{2}$	250 gallons.
" 2 "	10.00	$\frac{1}{2}$	$\frac{3}{4}$	500 "
" 3 "	15.00	$\frac{3}{4}$	1	960 "
" 4 "	20.00	1	$1\frac{1}{4}$	1,300 "
" 5 "	25.00	$1\frac{1}{4}$	$1\frac{1}{2}$	2,000 "
" 6 Iron	35.00	$1\frac{1}{4}$	2	4,000 "
" 7 "	45.00	$1\frac{1}{2}$	$2\frac{1}{2}$	8,000 "
" 8 "	55.00	2	3	11,000 "
" 9 "	70.00	$2\frac{1}{2}$	4	15,000 "
" 10 "	175.00	4	6	45,000 "

MODEL "P."

Sizes Nos. 6, 7 and 8 have iron body, balance brass.

Size No. 9 has brass tubes, balance iron.

Sizes Nos. 6, 7, 8 and 9 made entirely of brass, to order.

Size No. 10, flanged connections.

Special all-iron Ejectors made to order.



PRICES, MODEL "P."

Sizes.	Prices Model P.	Pipe Connections.		Capacity per Hour with 50 lbs. Steam Pressure.
		Steam.	Suction and Delivery.	
1	\$8.00 Brass	$\frac{3}{8}$	$\frac{1}{2}$	250 gallons.
2	10.00 "	$\frac{1}{2}$	$\frac{3}{4}$	500 "
3	15.00 "	$\frac{3}{4}$	1	960 "
4	20.00 "	1	$1\frac{1}{4}$	1,300 "
5	25.00 "	$1\frac{1}{4}$	$1\frac{1}{2}$	2,000 "
6	35.00 Iron	$1\frac{1}{4}$	2	4,000 "
7	45.00 "	$1\frac{1}{2}$	$2\frac{1}{2}$	8,000 "
8	55.00 "	2	3	11,000 "
9	70.00 "	$2\frac{1}{2}$	4	15,000 "

Sizes Nos. 6, 7 and 8 have iron body, balance brass.

Size No. 9 has brass tubes, balance iron.

Sizes Nos. 6, 7, 8 and 9 made entirely of brass, to order.

Special all-iron Ejectors made to order.

## WATER PRESSURE EJECTOR.

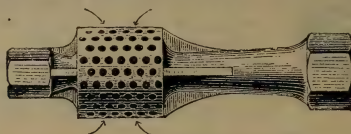


Fig. 27.

This instrument is worked by water pressure and used to advantage in excavations, cellars, etc., where water pressure can be had and the required elevation does not exceed 12 feet. It has to be inserted into the water pressure pipe in such a manner that it will be entirely covered by the water to be raised. It will raise double the quantity of water which it obtains from the pressure pipe, *i. e.*, it will deliver two gallons for every one it receives from the pressure pipe.

### DIMENSIONS AND PRICES.

Number of Water Pressure Ejector .....	1	2	3
Capacity, gallons per hour.....	375	600	1,275
Size of Water Pressure Pipe, inch.....	$\frac{1}{2}$	$\frac{3}{4}$	1
Size of Delivery Pipe, inch.....	1	1 $\frac{1}{2}$	2
Price—Steam Metal.....	\$15.00	\$20.00	\$30.00

## NOISELESS WATER HEATER.



Fig. 29.

This instrument is used for warming of liquids; it avoids the noise that is otherwise caused by the action of steam led direct into cold liquids for that purpose.

In operation, the liquid is drawn through the holes in body and discharged through shank, causing a circulation of the liquid in tank.

Number of Noiseless Water Heater.	3	4	5	6	7	8
Diameter of Steam Pipe, inch .....	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2
Price—Iron Body, Brass Nozzle....	\$10.00	\$15.00	\$20.00	\$25.00	\$30.00	\$40.00



# IRON EJECTORS.

(WITH STEAM METAL NOZZLE.)

FOR LIFTING AND FORCING LIQUIDS.



Fig. 26.

Adapted for Water Stations on Railroads, Wrecking Purposes, Tanneries, Breweries, Chemical Works, Distilleries, Etc.

## TABLE OF DIMENSIONS AND PRICES.

Number of Ejector.....	1	2	3	4	5	6	7	8	9	10	11
Capacity, gallons per hour ....	150	250	375	750	1,500	2,475	3,750	6,000	9,000	12,000	18,000
Size of Steam Pipe ..... inch	$\frac{1}{2}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	2	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Size of Suction Pipe ..... "	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Size of Delivery Pipe ..... "	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	2	2	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Iron Case, Steam Metal Nozzles	\$7.50	\$8.00	\$10.00	\$12.00	\$15.00	\$20.00	\$25.00	\$35.00	\$50.00	\$60.00	\$70.00
All Steam Metal.....	15.00	16.00	20.00	24.00	30.00	40.00	50.00	70.00	.....	.....	.....

The above capacities are based upon a steam pressure of 60 lbs. and an elevation of 32 feet.

# HARD LEAD EJECTORS.

FOR LIFTING AND FORCING ACIDS.

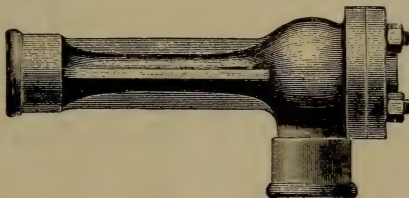


Fig. 26a.

## LIST OF PRICES.

Number of Ejector..	1	2	3	4	5	6	7	8	9	10	11
Prices.....	\$16.00	\$18.00	\$22.00	\$26.00	\$30.00	\$37.50	\$45.00	\$60.00	\$80.00	\$105.00	\$130.00

Size of Steam Pipe, same as Fig. 26.

Size of Suction and Delivery Pipes, same as Fig. 26, not threaded, but arranged for soldering

## BRASS GLOBE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC

Screwed Hub, Iron Wheel.

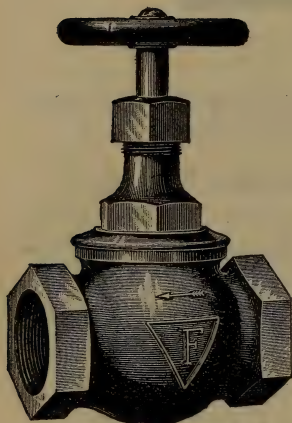


Fig. 1.  
SCREW ENDS.

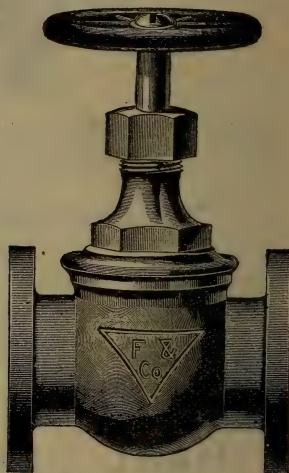


Fig. 39.  
FLANGE ENDS.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 1 .....	1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
Distance End to End	$1\frac{1}{2}$	$1\frac{1}{4}$	2	$2\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{1}{8}$	$6\frac{3}{8}$	7

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 39 .....	6.00	9.00	11.00	16.50	25.00	34.00
Distance, Face to Face.....	$4\frac{7}{8}$	$5\frac{1}{2}$	6	$7\frac{1}{8}$	8	9
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

Complete Valve Catalogue sent on application.

## BRASS ANGLE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Screwed Hub, Iron Wheel.

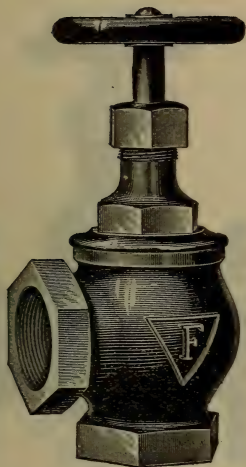


Fig. 9.

SCREW ENDS.



Fig. 40.

FLANGE ENDS.

Size.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 9.....	1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
Distance Centre to Inlet or Outlet...	$\frac{3}{4}$	$1\frac{1}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$3\frac{1}{8}$	$3\frac{1}{2}$

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price Fig. 40.....	6.00	9.00	11.00	16.50	25.00	34.00
Distance Centre to Face.....	$2\frac{7}{8}$	$2\frac{3}{4}$	3	$3\frac{7}{8}$	4	$4\frac{1}{2}$
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

Complete Valve Catalogue sent on application.

EXTRA HEAVY  
BRASS GLOBE VALVES.

RENEWABLE DISC.

Screwed Hub (Follower in Stuffing Box), Iron Wheel.

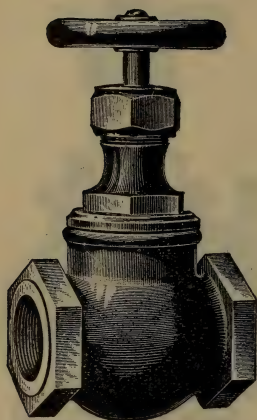


Fig. 309.  
SCREW ENDS.

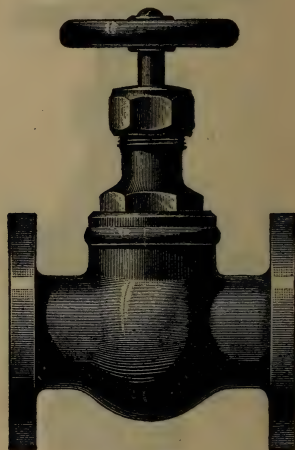


Fig. 310.  
FLANGE ENDS.

Size.....	$\frac{1}{8}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price, Fig. 309.....	4.25	6.00	8.00	10.00	13.75	22.00	42.00
Distance End to End.....	$3\frac{1}{4}$	$3\frac{1}{2}$	$4\frac{1}{8}$	$4\frac{5}{8}$	5	6	$7\frac{1}{8}$

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 310.....	10.00	12.50	16.00	32.00	42.00	54.00
Distance Face to Face.....	4	$4\frac{7}{8}$	$5\frac{1}{4}$	$6\frac{1}{2}$	$7\frac{3}{4}$	$8\frac{1}{2}$
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

Complete Valve Catalogue sent on application.



EXTRA HEAVY  
BRASS ANGLE VALVES.

RENEWABLE DISC.

Screwed Hub (Follower in Stuffing Box), Iron Wheel.

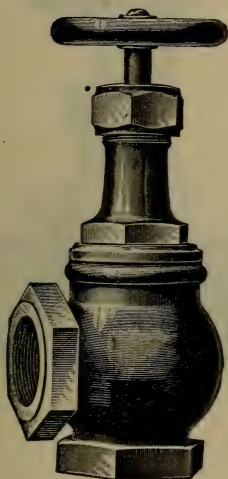


Fig. 311.

SCREW ENDS.

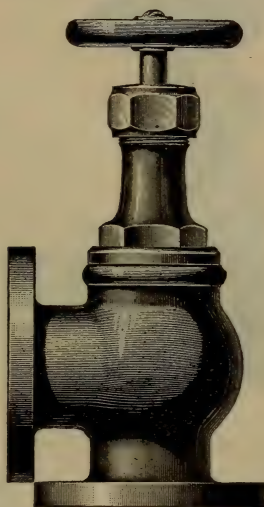


Fig. 312.

FLANGE ENDS.

Size.....	$\frac{1}{8}$	$\frac{3}{8}$	1	$1\frac{1}{4}$	$1\frac{3}{8}$	2	$2\frac{1}{2}$	3
Price, Fig. 311.....	4.25	6.00	8.00	10.00	13.75	22.00	31.00	42.00
Distance Centre to Inlet or Outlet.....	$1\frac{1}{8}$	$1\frac{3}{8}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$	3	$3\frac{1}{8}$	$4\frac{1}{4}$

Size.....	1	$1\frac{1}{4}$	$1\frac{3}{8}$	2	$2\frac{1}{2}$	3
Price, Fig. 312.....	10.00	12.50	16.00	22.00	42.00	54.00
Distance Centre to Face.....	2	$2\frac{1}{8}$	$2\frac{3}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$4\frac{1}{4}$
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

Complete Valve Catalogue sent on application.

# RADIATOR BRASS GLOBE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Wood Wheel.

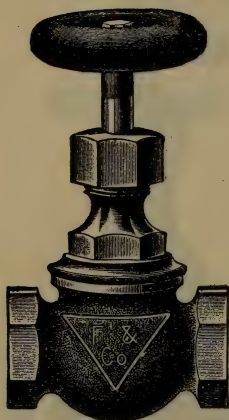


Fig. 2.

SCREW ENDS.

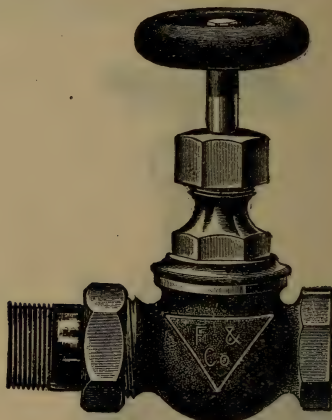


Fig. 8.

MALE UNION OUTLET.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
<b>Price, Fig. 2.</b>								
Rough Body, Finished Trimmings.....	1.50	1.65	2.00	2.50	3.20	4.50	6.25	10.50
Rough Body, Plated Trimmings.....	1.75	1.90	2.25	2.70	3.50	4.75	6.50	10.75
Rough Body, Nickel Plated.....	2.00	2.15	2.50	2.85	3.65	4.90	6.75	11.00
Finished all over.....	2.00	2.15	2.50	3.00	3.75	5.25	7.25	11.75
Finished all over and Nickel Plated.....	2.85	2.60	2.85	3.10	4.00	5.40	7.75	12.25
Distance End to End.....	$1\frac{1}{4}$	2	$2\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$
<hr/>								
Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
<b>Price, Fig. 8.</b>								
Rough Body, Finished Trimmings.....	2.75	3.50	4.30	5.85	7.75	12.00		
Rough Body, Plated Trimmings.....	3.00	3.75	4.65	6.25	8.00	12.85		
Rough Body, Nickel Plated.....	3.20	3.80	4.75	6.40	8.10	13.10		
Finished all over.....	3.20	4.00	4.80	6.40	8.75	13.85		
Finished all over and Nickel Plated.....	3.25	4.25	5.25	7.00	9.25	14.35		
Distance End to End, including Union Nipple	$3\frac{1}{4}$	$4\frac{1}{2}$	$5\frac{1}{4}$	$5\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{3}{4}$		

Above prices cover Wood Handle, Tee Handle, Square on Stem, or Lock Shield.  
Complete Valve Catalogue sent on application.

# RADIATOR BRASS ANGLE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Wood Wheel.

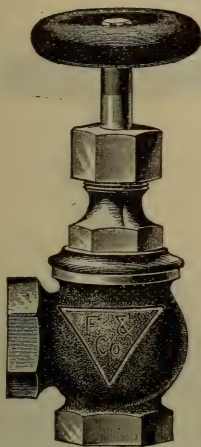


Fig. 11.

SCREW ENDS.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
<b>Price, Fig. 11.</b>								
Rough Body, Finished Trimmings.....	1.50	1.65	2.00	2.50	3.20	4.50	6.25	10.50
Rough Body, Plated Trimmings.....	1.75	1.90	2.25	2.70	3.50	4.75	6.50	10.75
Rough Body, Nickel Plated.....	2.00	2.15	2.50	2.85	3.65	4.90	6.75	11.00
Finished all over.....	2.00	2.15	2.50	3.00	3.75	5.25	7.25	11.75
Finished all over and Nickel Plated.....	2.35	2.50	2.85	3.10	4.00	5.40	7.75	12.25
Distance Centre to Inlet or Outlet.....	$1\frac{1}{8}$	1	$1\frac{1}{8}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$
<b>FEMALE UNION INLET.</b>								
Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2		
<b>Price, Fig. 12.</b>								
Rough Body, Finished Trimmings.....	2.75	3.50	4.30	5.85	7.75	12.60		
Rough Body, Plated Trimmings.....	3.00	3.75	4.65	6.25	8.00	12.85		
Rough Body, Nickel Plated.....	3.20	3.80	4.75	6.40	8.10	13.10		
Finished all over.....	3.20	4.00	4.80	6.40	8.75	13.85		
Finished all over and Nickel Plated.....	3.25	4.25	5.25	7.00	9.25	14.35		
Distance Centre to Inlet.....	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{1}{2}$		
Distance Centre to End of Union Nipple.....	$2\frac{1}{8}$	$2\frac{5}{8}$	$3\frac{1}{8}$	$3\frac{3}{4}$	4	$4\frac{5}{8}$		

Above Prices cover Wood Handle, Tee Handle, Square on Stem, or Lock Shield.  
Complete Valve Catalogue sent on application.

## IRON BODY GLOBE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Composition Hub and Mountings.

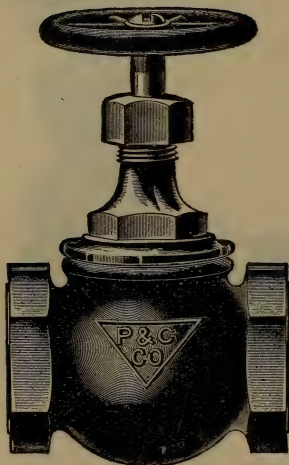


Fig. 69.

SCREW ENDS.

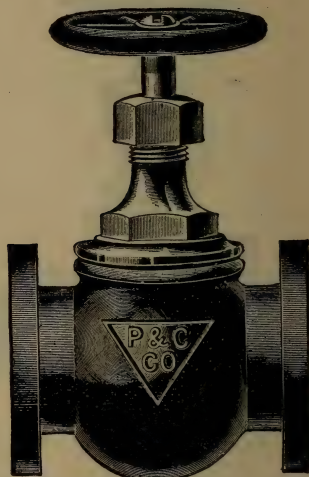


Fig. 70.

FLANGE ENDS.

Size .....	1½	2	2½	3	3½	4
Price, Fig. 69 .....	5.00	7.25	11.00	16.00	18.50	23.00
Distance End to End .....	5	6	7½	8½	9½	10½

Size .....	1½	2	2½	3	3½	4
Price, Fig. 70 .....	6.00	8.50	13.00	18.00	20.50	25.00
Distance Face to Face .....	5¼	6½	8	8½	10½	10¾
Diameter of Flanges .....	5	6	7	7½	8½	9

Complete Valve Catalogue sent on application.



## IRON BODY ANGLE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Composition Hub and Mountings.



Fig. 71.

SCREW ENDS.



Fig. 72.

FLANGE ENDS.

Size .....	1½	2	2½	3	3½	4
Price, Fig. 71 .....	5.00	7.25	11.00	16.00	18.50	23.00
Distance Centre to Inlet or Outlet.....	2½	4½	4½	5½	5½	7

Size .....	1½	3	2½	3	3½	4
Price, Fig. 72 .....	6.00	8.50	12.00	18.00	20.50	25.00
Distance Centre to Face.....	2½	4½	4½	4½	5½	5½
Diameter of Flanges.....	5	6	7	7½	8½	9

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## BRASS CROSS VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Screwed Hub, Iron Wheel.

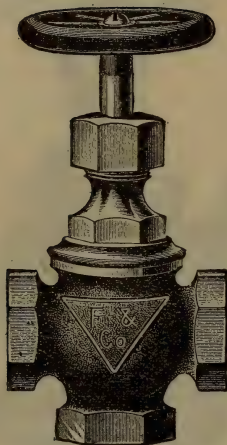


Fig. 36.

SCREW ENDS.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 36.....	2.25	2.50	3.25	4.75	6.25	9.50	20.00	30.00
Distance End to End.....	$2\frac{1}{16}$	$3\frac{1}{8}$	$3\frac{3}{8}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{1}{4}$
Distance Centre to Bottom Inlet.....	$1\frac{7}{16}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$	$3\frac{1}{4}$

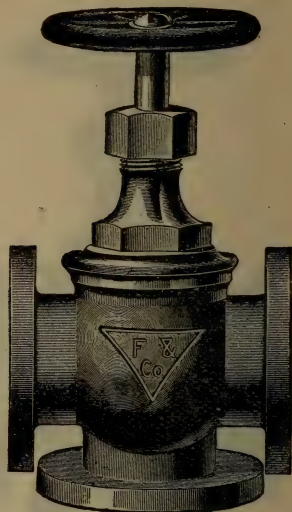


Fig. 300.

FLANGE ENDS.

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 300.....	8.75	11.50	15.25	23.00	32.00	47.00
Distance Face to Face.....	$4\frac{3}{8}$	$5\frac{1}{2}$	6	$7\frac{1}{2}$	8	9
Distance Centre to Bottom Inlet.....	$2\frac{7}{16}$	$2\frac{3}{8}$	3	$3\frac{7}{8}$	4	$4\frac{1}{2}$
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$

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## IRON BODY CROSS VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Composition Hub and Mountings.

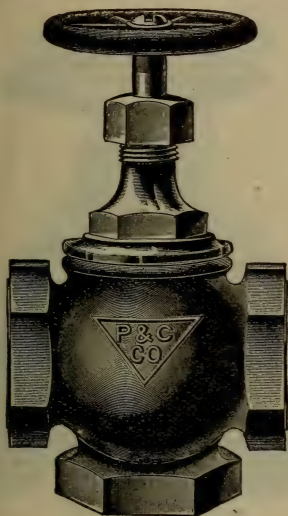


Fig. 77.

SCREW ENDS.

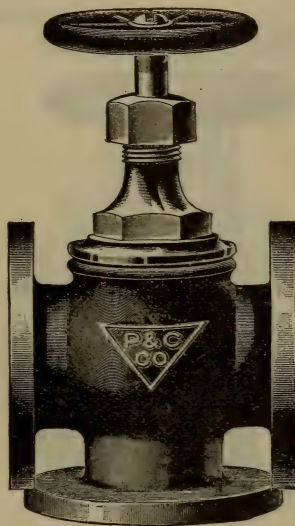


Fig. 78.

FLANGE ENDS.

Size.....	1½	2	2½	3	3½	4
Price, Fig. 77.....	12.00	14.00	16.00	21.00	25.00	27.00
Distance End to End.....	5	6	8½	8½	9	10½
Distance Centre to Bottom Inlet.....	2½	8	4½	4½	4½	5½
Size.....	1½	2	2½	3	3½	4
Price, Fig. 78.....	15.00	17.00	19.00	24.00	27.00	30.00
Distance Face to Face.....	5½	8½	9½	8½	10½	11
Distance Centre to Face of Bottom Flange.....	2½	4½	4½	4½	5½	5½
Diameter of Flanges.....	5	6	7	7½	8½	9

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# IRON BODY GLOBE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Composition Mountings, Yoke.

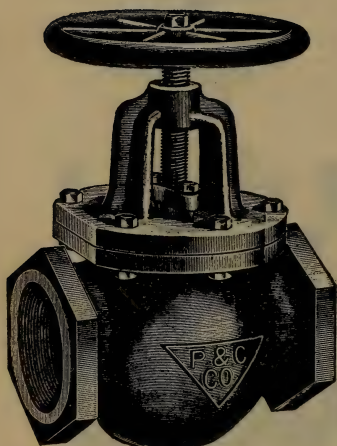


Fig. 73.

SCREW ENDS.

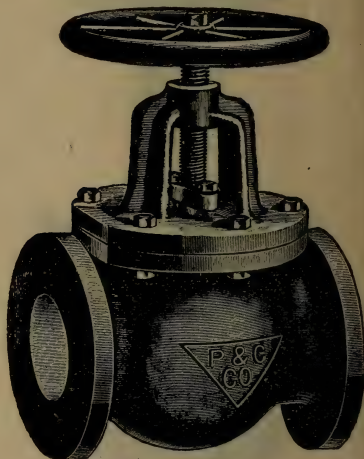


Fig. 74.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 73.....	10.00	12.00	16.75	19.50	24.00	32.00	40.00	48.00	80.00	90.00	....	130.00	185.00
Dist. End to End....	6	7½	8½	9½	10¾	10¾	11¼	13¾	14¾	18¾	....	20	23¾

Size.....	3	2½	3	3½	4	4½	5	6	7	8	9	10	12	14
Price, Fig. 74....	11.75	14.00	18.50	21.50	26.00	34.00	42.00	50.00	80.00	90.00	....	130.00	185.00	334.00
Distance Face to Face...	6½	8	8½	10½	10¾	11¾	12	15½	15¾	17	....	20	23¾	25½
Diam. of Flanges	6	7	7½	8½	9	9¼	10	11	12½	13½	....	16	19	21

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## IRON BODY ANGLE VALVES.

RENEWABLE VULCANIZED ASBESTOS DISC.

Composition Mountings, Yoke.

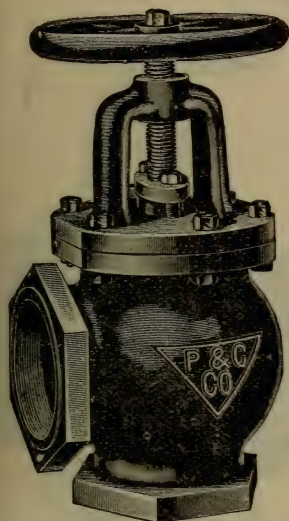


Fig. 75.

SCREW ENDS.

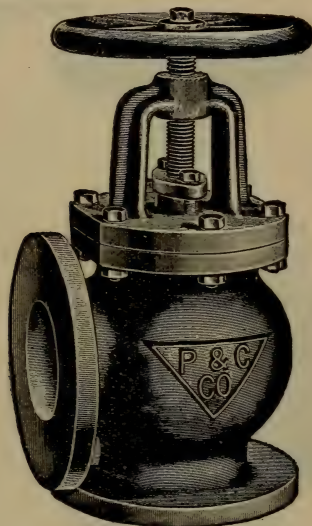


Fig. 76.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	13
Price, Fig. 75 .....	10.00	12.00	16.75	19.50	24.00	32.00	40.00	48.00	80.00	90.00	....	130.00	185.00
Distance Centre to Inlet or Outlet...	3	4¼	4½	4¾	5¼	5½	5¾	7	7¼	8½	....	10	11½

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	13	14
Price, Fig. 76 ..	11.75	14.00	18.50	21.50	26.00	34.00	42.00	50.00	80.00	90.00	....	130.00	185.00	334.00
Distance Centre to Face..	4½	4¾	4¾	5	5½	5¾	6¼	7¾	7¾	8½	....	10	11½	13¾
Diam of Flanges	6	7	7½	8½	9	9¼	10	11	12½	13½	....	16	19	21

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# HEAVY IRON BODY GLOBE VALVES.

RENEWABLE DISC.

Composition Mountings, Yoke.

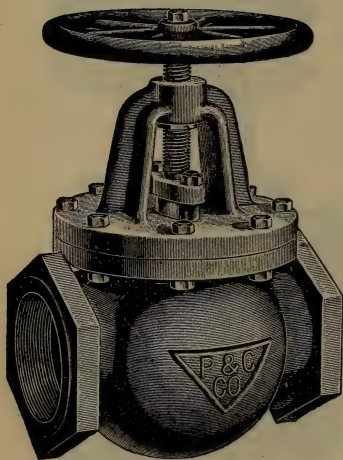


Fig. 185.

SCREW ENDS.

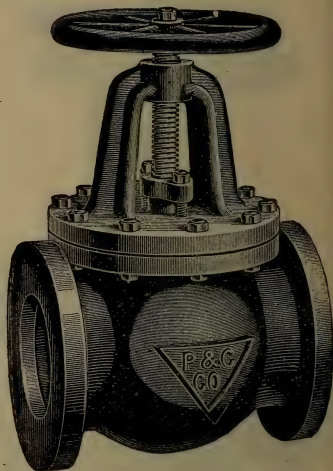


Fig. 328.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 185.....	12.00	14.50	20.10	23.40	28.80	38.40	48.00	57.60	96.00	108.00	....	156.00	222.00
Dist. End to End...	8½	8¾	9½	11	11½	....	13¾	15¼	15½	16¼	....	20	23¾

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
Price, Fig. 328	14.10	16.80	22.20	25.80	31.20	40.80	50.40	60.00	96.00	108.00	....	156.00	222.00	....	450.00
Distance Face to Face	9	10	10¾	11¾	12½	....	14¾	15½	17½	18	....	22	23¾	....	38
Diameter of Flanges.	6½	7½	9	9	10	10½	11	13	14	15	16	17½	20	23	26

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# HEAVY IRON BODY ANGLE VALVES.

RENEWABLE DISC.

Composition Mountings, Yoke.

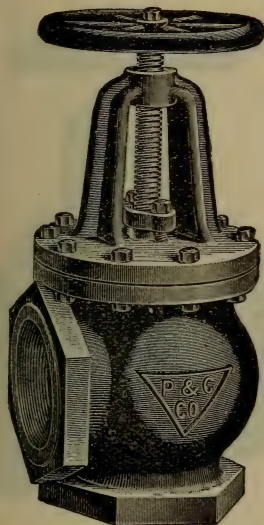


Fig. 329.

SCREW ENDS

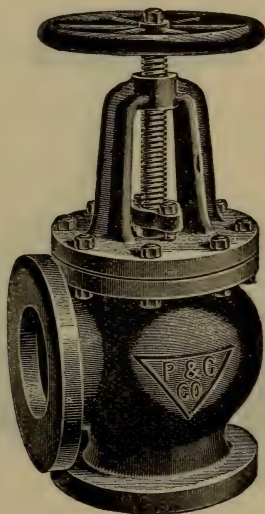


Fig. 186.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12		
Price, Fig. 329.....	12.00	14.50	20.10	23.40	28.80	38.40	48.00	57.60	96.00	108.00	....	156.00	222.00		
Distance, Centre to Inlet or Outlet	3½	4¼	4¾	5½	5¾	....	6¾	7¾	7¾	8½	....	10	11¾		
Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
Price, Fig. 186	14.10	16.80	22.20	25.80	31.20	40.80	50.40	60.00	96.00	108.00	....	156.00	222.00	....	450.00
Distance Cen. to Face	4½	4¾	5½	5¾	6	....	7	7¾	8¾	9¼	....	11¼	11¾	....	16¾
Diameter of Flanges..	6½	7½	9	9	10	....	11	13	14	15	....	17½	20	....	25

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EXTRA HEAVY  
IRON BODY GLOBE VALVES.

RENEWABLE DISC.

Composition Mountings, Yoke.

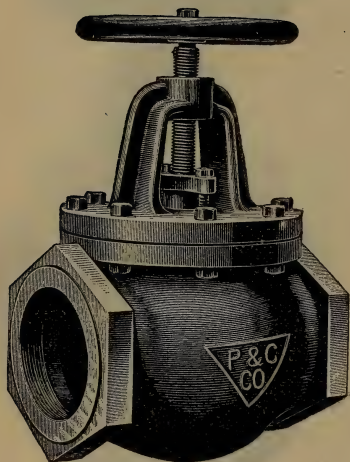


Fig. 330.  
SCREW ENDS.

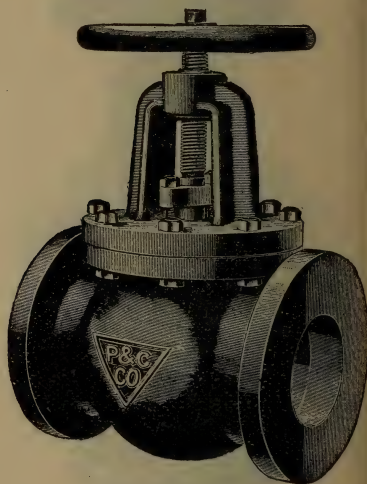


Fig. 187.  
FLANGE ENDS.

Size .....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 330.....	12.50	15.00	21.00	24.50	30.00	40.00	50.00	60.00	100.00	113.00	....	163.00	232.00
Distance End to End...	8½	8¾	9¾	11	11½	....	13¾	15¾	15½	16¼	....	20	22¾

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 187.....	14.70	17.50	23.25	27.00	32.50	42.50	52.50	62.50	100.00	113.00	....	163.00	232.00
Distance Face to Face..	9	10	10¾	11¾	12½	....	14¼	15¾	17½	18	....	22	23¾
Diameter of Flanges...	6½	7½	9	9	10	....	11	13	14	15	....	17½	20

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# EXTRA HEAVY IRON BODY ANGLE VALVES.

RENEWABLE DISC.

Composition Mountings, Yoke.

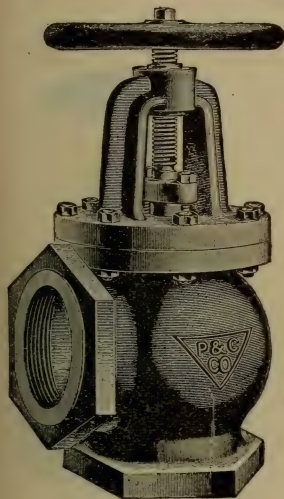


Fig. 188.

SCREW ENDS.

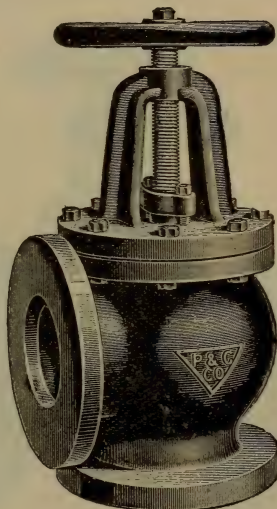


Fig. 331.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 188.....	12.50	15.00	21.00	24.50	30.00	40.00	50.00	60.00	100.00	113.00	....	163.00	232.00
Distance Centre to Inlet or Outlet	3½	4¼	4¾	5½	5¼	....	6¾	7¼	7¾	8½	....	10	11¾

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 331.....	14.70	17.50	23.25	27.00	32.50	42.50	52.50	62.50	100.00	113.00	....	163.00	232.00
Distance Centre to Face	4½	4¾	5¾	5¾	6	....	7	7¾	8¾	9¼	....	11¼	11¾
Diagram of Flanges....	6½	7½	9	9	10	....	11	13	14	15	....	17½	20

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## BRASS GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Screwed Hub, Iron Wheel.

Stationary Spindle.

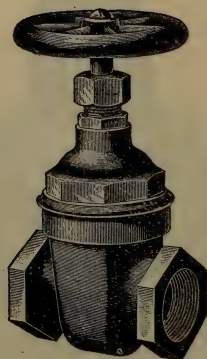


Fig. 101.

SCREW ENDS.

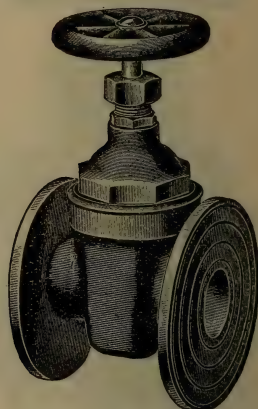


Fig. 102.

FLANGE ENDS.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Fig. 101.....	1.50	1.50	1.65	2.20	2.80	4.00	5.30	7.80	17.00	23.00	45.00	56.00
Distance End to End....	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$6\frac{5}{8}$	$7\frac{1}{2}$	$8\frac{3}{8}$	$8\frac{3}{8}$
Size .....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4		
Price, Fig. 102.....	4.65	5.65	7.50	9.35	14.00	16.00	26.50	35.75	57.00	68.00		
Distance Face to Face...	$2\frac{1}{8}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$5\frac{3}{8}$	$6\frac{3}{4}$	$8\frac{1}{8}$	$9\frac{1}{8}$	10		
Diameter of Flanges...	3	3	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9		

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# EXTRA HEAVY BRASS GATE VALVES.

RENEWABLE SEAT RINGS.

Screwed Hub, Iron Wheel.

Stationary Spindle.

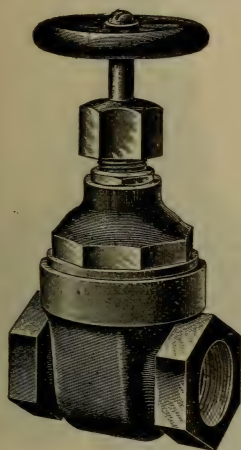


Fig. 213.

SCREW ENDS.

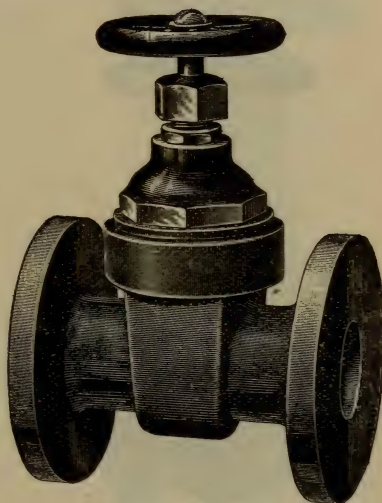


Fig. 334.

FLANGE ENDS.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price, Fig. 213.....	4.50	4.75	7.25	10.00	14.75	25.00
Distance End to End.....	$3\frac{5}{8}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{7}{8}$	5	$5\frac{1}{2}$
Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2		
Price, Fig. 334.....	8.75	11.50	18.75	28.00		
Distance Face to Face.....	5	$5\frac{3}{4}$	6	$9\frac{1}{4}$		
Diameter of Flanges.....	4	$4\frac{1}{2}$	5	$6\frac{1}{2}$		

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## IRON BODY GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Composition Mountings, Bolted Bonnet, Screw Ends.

Stationary Spindle.

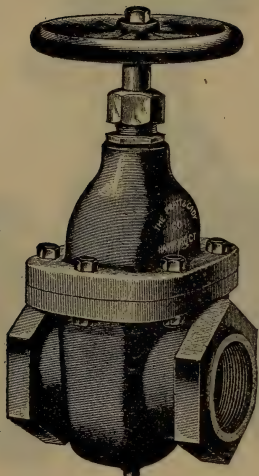


Fig. 109.  
SCREWED PACKING NUT.

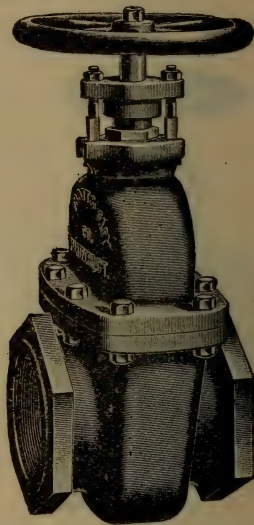


Fig. 209.  
BOLTED PACKING GLAND.

Size .....	2	2½	3	3½	4
Price, Fig. 109 .....	7.50	10.75	14.00	18.25	20.50
Distance End to End .....	5¼	6½	7½	8¾	8¾

Size .....	4½	5	6	7	8	9	10	12
Price, Fig. 209 .....	25.00	27.00	34.00	41.00	51.50	.....	73.00	100.00
Distance End to End .....	9½	9½	10	10½	11½	.....	13¼	16¾

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## IRON BODY GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Composition Mountings, Bolted Bonnet Flange Ends.

Stationary Spindle.

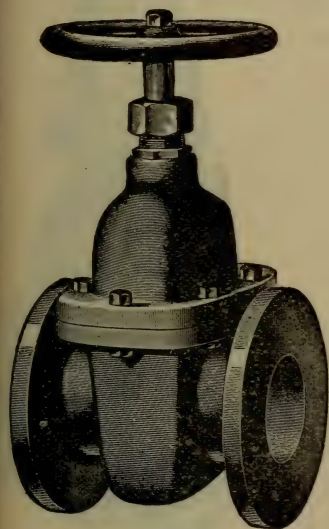


Fig. 110.

SCREWED PACKING NUT.

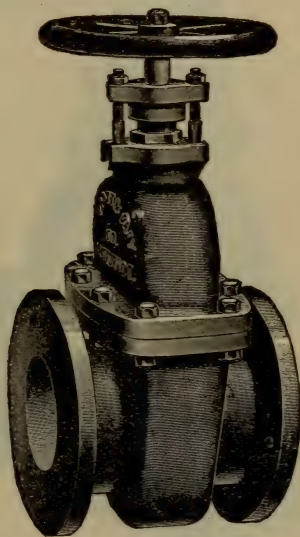


Fig. 216.

BOLTED PACKING GLAND.

Size.....	2	2½	3	3½	4
Price, Fig. 110.....	7.50	10.75	14.00	18.25	20.50
Distance Face to Face.....	7¼	7⅞	8¼	8⅞	9¼
Diameter of Flanges.....	8	7	7½	8½	9

Size.....	4½	5	6	7	8	9	10	12	14	16	18	20	24
Price, Fig. 216....	25.00	27.00	34.00	41.00	51.50	....	73.00	100.00	168.00	223.00	292.00	346.00	494.00
Distance Face to Face....	10¼	10½	10⅞	11⅞	12¼	....	13¼	16¼	18	19	20	22	24
Diam. of Flanges	9¼	10	11	12¼	13½	....	16	19	21	23¼	25	27½	31½

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## IRON BODY GATE VALVES.

RENEWABLE VULCANIZED ASBESTOS SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Square Nut on Spindle.

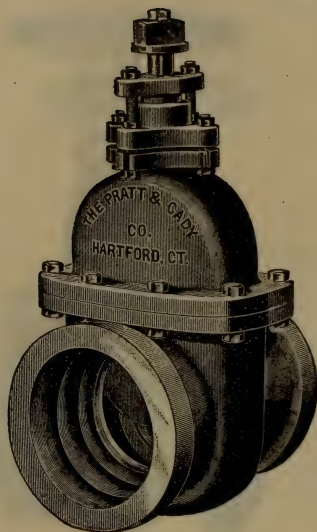


Fig. 113.

BELL ENDS.

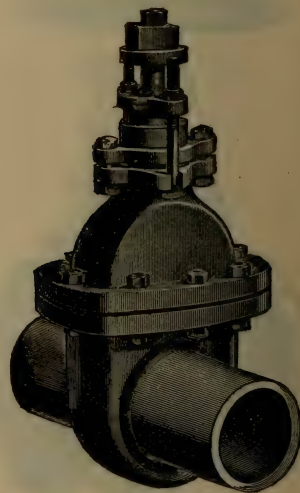


Fig. 114.

SPIGOT ENDS.

Size.....	2	3	4	5	6	7	8	10	12	14	16	18	20	24
Price, Fig. 113.....	7.50	14.00	20.50	27.00	34.00	41.00	51.50	73.00	100.00	168.00	223.00	292.00	346.00	494.
Depth of Bell.....	3	3	3	3	3	3	3	3	3 1/4	3 1/4	3 1/2	3 1/2	3 3/4	4
Distance End to End of Pipe when laid in Bell.....	3	3 1/4	4 1/4	4 1/2	4 3/4	5 1/4	5 1/2	6 1/4	6 3/4	9 1/4	10 1/2	11 1/4	13 1/2	14 1/2

Size.....	2	3	4	5	6	7	8	10	12	14	16	18	20	24
Price, Fig. 114.....	7.50	14.00	20.50	27.00	34.00	41.00	51.50	73.00	100.00	168.00	223.00	292.00	346.00	494.
Distance End to End of Spigot..	17 1/2	20 1/2	22 1/2	23	22 1/2	23	23 3/4	24 3/4	27	30	32	34 1/2	35 1/2	38 1/2

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## IRON BODY GATE VALVES.

RENEWABLE

VULCANIZED ASBESTOS SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Rising Spindle.



Fig. 217.

SCREW ENDS.

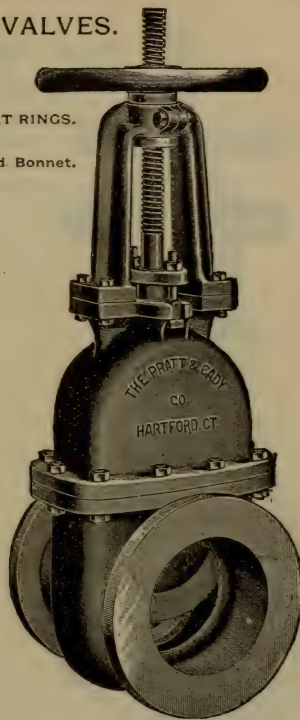


Fig. 218.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 217.....	16.50	22.75	26.00	31.75	36.50	44.00	51.00	61.00	71.00	91.00	....	124.00	154.00
Dist. End to End...	5¾	6¾	7½	8¾	8¾	9½	9½	10	10¾	11½	....	13¼	16¾

Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	15	18	20	24
Price, Fig. 218.....	16.50	22.75	26.00	31.75	36.50	44.00	51.00	61.00	71.00	91.00	124.00	154.00	232.00	300.00	417.00	457.00	668.00
Dist. Face to Face	7¼	7¾	8¼	8¾	9¼	10¼	10¾	11¼	12¼	13¼	16¾	18	19	20	22	24	
Diam. of Flanges	6	7	7½	8½	9	9¼	10	11	12¼	13¼	16	19	21	23¼	25	27¼	31¼

Complete Valve Catalogue sent on application.

# HEAVY IRON BODY GATE VALVES.

RENEWABLE SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Stationary Spindle.

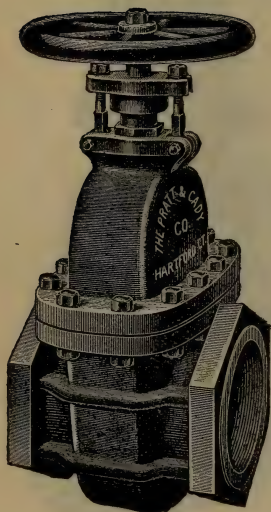


Fig. 226.

SCREW ENDS.

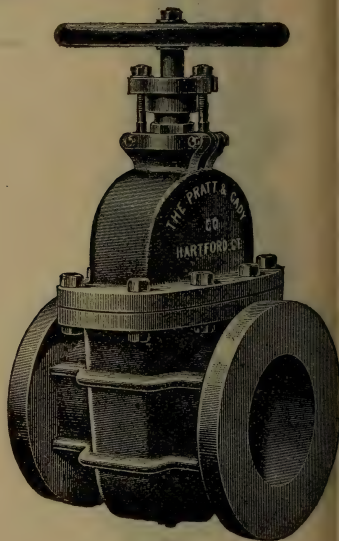


Fig. 227.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 226.....	10.00	14.25	18.75	24.00	27.25	33.00	35.75	45.75	54.50	68.75	....	97.50	132.00
Dist. End to End....	6¾	8	8½	8¾	9½	10	11	12¾	13½	13¾	....	16	17½

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16	18	20
Price, Fig. 227	10.00	14.25	18.75	24.00	27.25	33.00	35.75	45.75	54.50	68.75	....	97.50	132.00	189.00	248.00	317.00	366.00
Dist. Face to Face	8½	9½	10	10¾	11	11½	12¾	14	14½	15	....	17¾	20	22	23¾	24¾	26¾
Diam. of Flanges	6½	7½	9	9	10	10¾	11	13	14	15	....	17¾	20	23	25	27¾	29

Complete Valve Catalogue sent on application.



# HEAVY IRON BODY GATE VALVES.

RENEWABLE SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Rising Spindle.

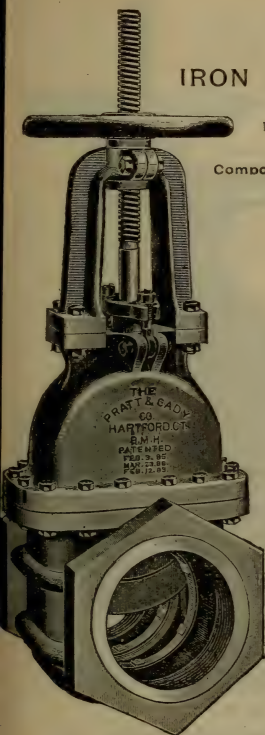


Fig. 228.

SCREW ENDS.

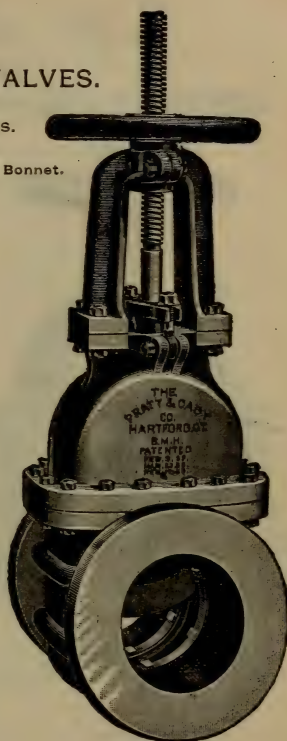


Fig. 278.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12				
Price, Fig. 228....	21.00	25.25	30.00	36.75	40.75	48.50	57.00	69.00	80.00	100.00	...	136.00	194.00				
Dist. End to End..	6¾	8	8½	8¾	9½	10	11	12¾	13½	13¾	....	16	17½				
Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16	18	20	24
Price, Fig. 278 {	21.00	25.25	30.00	36.75	40.75	48.50	57.00	69.00	80.00	100.00	136.00	194.00	269.00	348.00	464.00	623.00	823.00
Dist. Face to Face {	6½	9½	10	10¾	11	11½	12¼	14	14½	15	17¼	20	22	23¾	24½	26¼	31
Diam. of Flanges {	6½	7½	9	9	10	10¾	11	13	14	15	17¼	20	22	25	27¼	29	34

Complete Valve Catalogue sent on application

# EXTRA HEAVY IRON BODY GATE VALVES.

RENEWABLE SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Stationary Spindle.

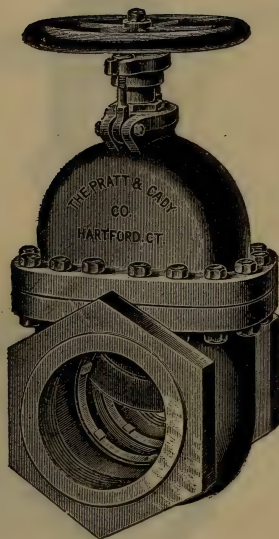


Fig. 111.

SCREW ENDS.

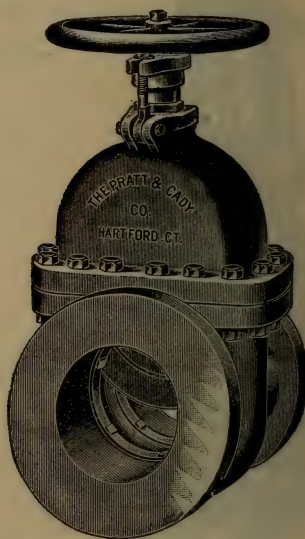


Fig. 112.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 111.....	11.25	16.15	21.00	27.35	30.75	37.50	40.50	51.00	61.50	77.25	....	109.50	150.00
Dist. End to End...	6¾	8	8½	8¾	9½	10	11	12¾	13½	13¾	....	16	17½

Size.....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16	18	20	24
Price, Fig. 112 }	11.25	16.15	21.00	27.35	30.75	37.50	40.50	51.00	61.50	77.25	109.50	150.00	200.00	255.00	332.00	405.00	510.00
Dist. Face to Face	8½	9½	10	10½	11	11½	12¼	14	14½	15	17¼	20	22	23¼	24½	26½	31
Diam. of Flanges	6¾	7¼	9	9	10	10½	11	13	14	15	17½	20	23	25	27½	29	34

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EXTRA HEAVY  
IRON BODY GATE VALVES.

RENEWABLE SEAT RINGS.

Composition Mountings, Bolted Bonnet.

Rising Spindle,

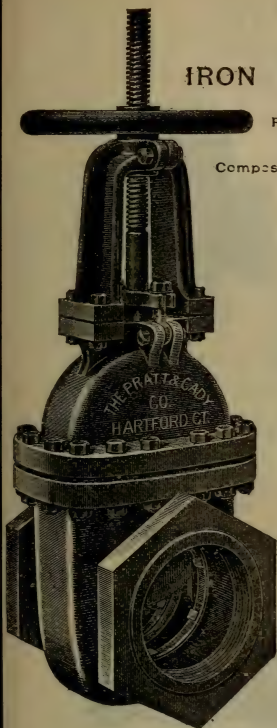


Fig. 229.

SCREW ENDS.

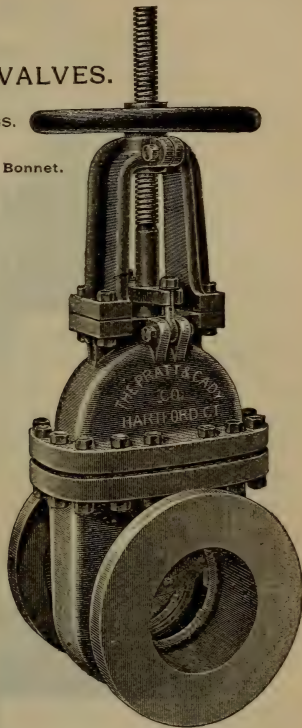


Fig. 279.

FLANGE ENDS.

Size .....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 229 .....	22.00	26.25	32.25	39.00	43.50	52.00	60.00	74.00	90.00	110.00	158.00	218.00	218.00
Dist. End to End ..	6¾	8	8½	8¾	9½	10	11	12¾	13½	13¾	18	17½	

Size .....	2	2½	3	3½	4	4½	5	6	7	8	10	12	14	16	18	20	24
Price, Fig. 279 .....	22.00	26.25	32.25	39.00	43.50	52.00	60.00	74.00	90.00	110.00	158.00	218.00	300.00	383.00	533.00	646.00	1,100.00
Dist. Face to Face ..	8¾	9½	10	10½	11	11½	12¼	14	14½	15	17¼	20	22	23¼	24½	26½	31
Diam. of Flanges ..	0¼	7½	9	9	10	10½	11	13	14	15	17½	20	23	25	27¼	29	34

Complete Valve Catalogue sent on application.

## BRASS CHECK VALVES.

STRAIGHTWAY SWINGING.

Screwed Cap, Rotating Brass Disc.

SCREW ENDS.

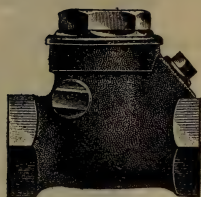


Fig. 60.



Fig. 57.

BOTH HORIZONTAL AND VERTICAL.

ANGLE.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 60.....	1.25	1.30	1.50	1.75	2.25	3.25	4.25	6.25	12.00	20.00
Price, Fig. 57.....			1.50	1.75	2.25	3.25	4.25	6.25	12.00	20.00
Distance End to End, Fig. 60...	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{4}$	$3\frac{3}{8}$	$3\frac{1}{4}$	$4\frac{1}{4}$	$5\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{1}{8}$
Distance Centre to Inlet or Outlet, Fig. 57.....			$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{8}$	$2\frac{1}{8}$	$2\frac{3}{4}$	$3\frac{5}{8}$	$4\frac{3}{8}$

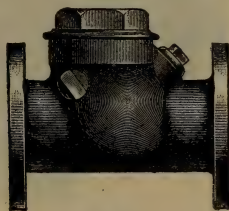


Fig. 179.



Fig. 339.

FLANGE ENDS,  
BOTH HORIZONTAL AND VERTICAL.SCREW ENDS,  
WITH ASBESTOS OR LEATHER DISC.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 179 .....			6.25	7.85	10.25	15.50	25.00	32.50
Distance Face to Face.....			5	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{3}{4}$	$8\frac{1}{4}$	$7\frac{3}{4}$
Diameter of Flanges .....			4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$
Price, Fig. 339, with Asbestos or Leather Disc	1.50	1.75	2.25	3.25	4.25	6.25	12.00	20.00
Distance End to End.....	$2\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{5}{8}$	$4\frac{1}{4}$	$4\frac{3}{8}$	$5\frac{1}{4}$	$6\frac{3}{8}$	$7\frac{3}{8}$

Complete Valve Catalogue sent on application.



# HEAVY BRASS CHECK VALVES.

STRAIGHTWAY SWINGING.

Screwed Cap, Rotating Brass Disc, Screw Ends.



Fig. 180.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
Price.....	2.50	2.50	2.60	3.00	4.00	5.75	7.50	11.00	22.00
Distance End to End.....	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	4	$4\frac{3}{8}$	$5\frac{3}{8}$	$7\frac{1}{4}$

# EXTRA HEAVY BRASS CHECK VALVES.

STRAIGHTWAY SWINGING.

Screwed Cap, Rotating Brass Disc, Screw Ends.

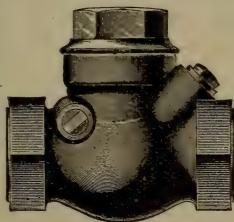


Fig. 181.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price.....	5.00	5.85	7.50	10.85	14.20	20.75
Distance End to End.....	4	$4\frac{1}{4}$	$5\frac{1}{2}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$

Complete Valve Catalogue sent on application.

# IRON BODY CHECK VALVES.

STRAIGHTWAY SWINGING.

Bolted Cap, Rotating Brass Disc.

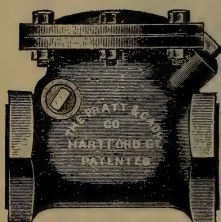


Fig. 90.  
SCREW ENDS.

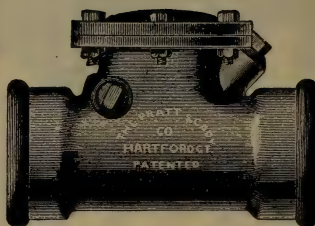


Fig. 92.  
BELL ENDS.



Fig. 91.  
FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price, Fig. 90.....	6.25	10.00	12.00	16.00	18.00	21.50	25.00	32.00	41.00	50.00	....	104.00	152.00
Distance End to End	5½	7¾	8	9¾	10	12	12	13½	14½	15	....	19¾	22½

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
Price, Fig. 91.	6.25	10.00	12.00	16.00	18.00	21.50	25.00	32.00	41.00	50.00	..	104.00	152.00	289.00	334.00
Distance															
Face to Face	8¾	8¾	8	9½	10½	11¾	11¾	13¾	14½	15¾	..	19¾	22½	25	34
Diameter															
of Flanges..	6	7	7½	8½	9	9¾	10	11	12½	13½	..	16	19	21	23½

Size .....	2	3	4	5	6	7	8	9	10	12	14	16
Price, Fig. 92.....	6.25	12.00	18.00	25.00	32.00	41.00	50.00	....	104.00	152.00	289.00	334.00
Depth of Bell.....	2¾	2¾	3	3	3	3	3	....	3	3¼	3¼	3½
Distance End to End of												
Pipe when laid in Bell....	4	6¾	8½	10½	11½	13½	12¾	....	17	20½	23	33

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## IRON BODY ANGLE CHECK VALVES.

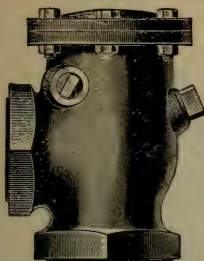


Fig. 93.  
SCREW ENDS.

STRAIGHTWAY SWINGING.

Bolted Cap, Rotating  
Brass Disc.

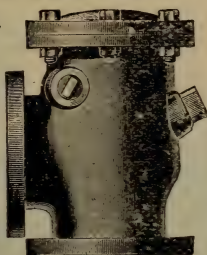


Fig. 94.  
FLANGE ENDS.

Size .....	2½	3	3½	4	4½	5	6	7	8
Price, Figs. 93 and 94 .....	10.00	12.00	16.00	18.00	....	25.00	32.00	41.00	50.00
Distance Centre to Inlet or Outlet, Fig. 93 .....	3¾	4	4¾	5	....	6	6¾	7¼	7½
Distance Centre to Face, Fig. 94 .....	4½	4	4¾	5¼	....	5¾	6¾	7¼	7½
Diameter of Flanges, Fig. 94 .....	7	7½	8½	9	....	10	11	12½	13½

EXTRA HEAVY

## IRON BODY CHECK VALVES.

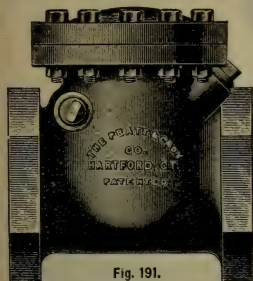


Fig. 191.  
SCREW ENDS.

STRAIGHTWAY SWINGING.

Bolted Cap, Rotating  
Brass Disc.

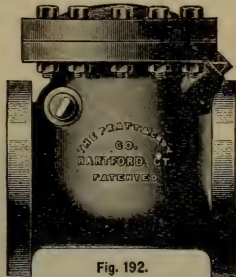


Fig. 192.  
FLANGE ENDS.

Size .....	2½	3	3½	4	4½	5	6	7	8	9	10
Price, Fig. 191 .....	16.00	19.00	26.50	29.00	....	43.00	56.00	70.00	85.00	....	132.00
Distance End to End .....	9¾	9	13¼	14	....	14½	16½	16¾	16½	....	24¾
Price, Fig. 192 .....	19.50	22.50	30.00	32.50	....	46.00	59.00	73.00	93.00	....	140.00
Distance Face to Face .....	9¾	11¼	13¼	14	....	14½	16½	16½	16½	....	24¾
Diameter of Flanges .....	7½	9	9	10	....	11	13	14	15	....	17½

Complete Valve Catalogue sent on application.

## IRON BODY BACK PRESSURE VALVES.

STRAIGHTWAY SWINGING.

Bolted Cap, Rotating Brass Disc.

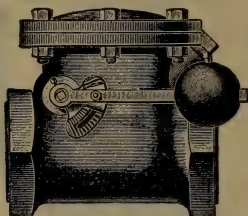


Fig. 95.

SCREW ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12
Price.....	5.00	8.00	9.60	12.00	13.50	....	18.00	23.50	29.50	38.00	...	57.00	80.50
Distance End to End....	5½	7½	8	9¾	10	....	12	13½	14½	15	....	19¾	22½

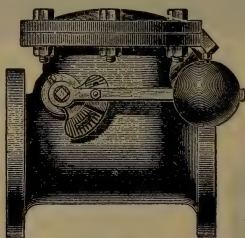


Fig. 96.

FLANGE ENDS.

Size.....	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16
Price.....	5.00	8.00	9.60	12.00	13.50	....	18.00	23.50	29.50	38.00	....	57.00	80.50	130.00	250.00
Distance															
Face to Face	8¾	8¼	8	9½	10½	....	11¾	13¾	14¾	15¾	....	19¾	22¼	25	34
Diameter of Flanges....	6	7	7½	8½	9	....	10	11	12½	13½	....	16	19	21	23½

By reversing lever this Valve can be used as a Balanced Disc Automatic Relief Valve for Condensing Engines. It opens automatically and permits of free exhaust to the atmosphere without clattering of the Disc, and while closed by the pressure of the atmosphere on top of the Disc a vacuum may be maintained within the Valve and its connections.

This Valve is also used in exhaust pipe between the Engine and Condenser to prevent the backward flow of water from the Condenser into the Engine.

In ordering, state pressure and conditions under which Valves will be required to work.

Complete Valve Catalogue sent on application.



## BRASS COCKS.

VULCANIZED ASBESTOS  
PACKED.

SCREW ENDS.

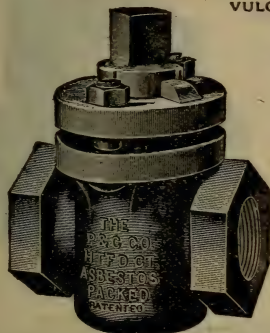


Fig. 115.

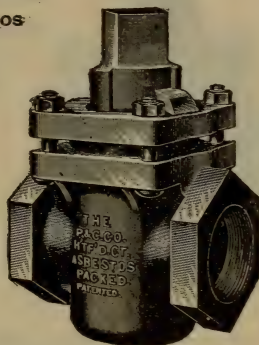


Fig. 345.

Fig. 115

Fig. 345

Size .....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price. Figs. 115 and 345....	3.35	3.35	3.35	4.20	5.60	8.00	10.35	16.00	26.50	37.50	50.50	64.00
Distance End to End.....	$2\frac{5}{8}$	$2\frac{5}{8}$	3	$3\frac{3}{8}$	4	$4\frac{5}{8}$	$5\frac{1}{8}$	6	7	$8\frac{1}{8}$	$8\frac{3}{4}$	$9\frac{1}{8}$

FLANGE ENDS.

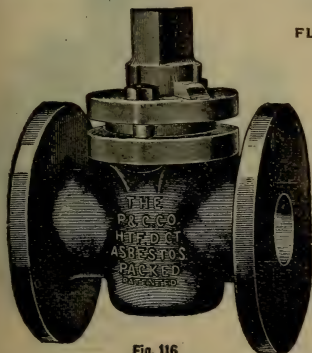


Fig. 116

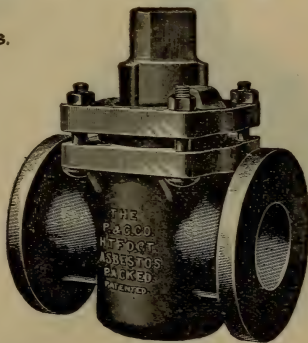


Fig. 346.

Fig. 116

Fig. 346

Size .....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5
Price Figs. 116 and 346.....	10.50	12.50	14.50	26.00	38.00	49.00	69.50	90.00	....	120.00
Distance Face to Face.....	$5\frac{1}{2}$	$5\frac{3}{4}$	$5\frac{5}{8}$	$7\frac{1}{8}$	$8\frac{1}{4}$	$9\frac{1}{4}$	$10\frac{1}{4}$	$11\frac{1}{2}$	....	$13\frac{1}{4}$
Diameter of Flanges .....	4	$4\frac{1}{2}$	5	6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	....	10

Complete Valve Catalogue sent on application

# EXTRA HEAVY BRASS COCKS.

VULCANIZED ASBESTOS  
PACKED

SCREW ENDS

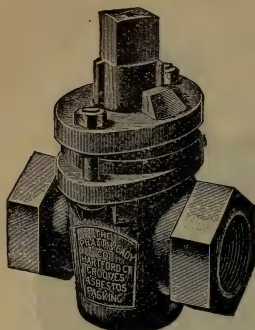


Fig. 240.

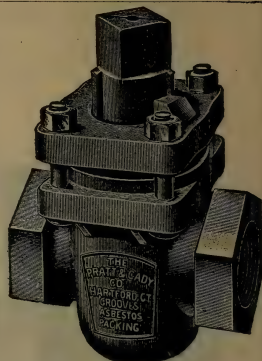


Fig. 241.

Fig. 240

Fig. 241.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 240 and 241	3.75	3.75	3.75	4.75	6.30	9.00	11.60	18.00	30.00	42.00	66.00	82.50
Distance End to End	$3\frac{1}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$11\frac{1}{2}$

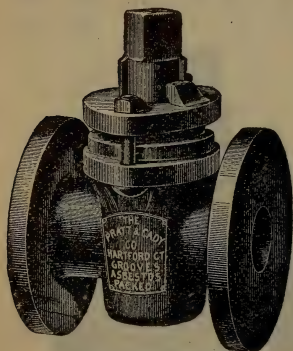


Fig. 347.

FLANGE ENDS.

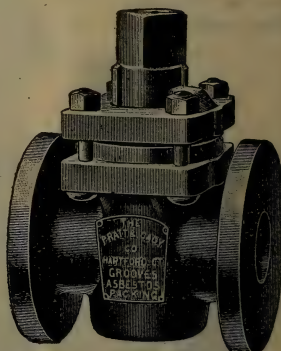


Fig. 348.

Fig. 347

Fig. 348.

Size .....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 347 and 348	12.00	15.00	17.00	29.00	42.00	60.00	76.50	93.00
Distance Face to Face.....	$5\frac{1}{2}$	$5\frac{3}{8}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{3}{8}$	$11\frac{1}{2}$	$12\frac{1}{2}$
Diameter of Flanges.....	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	9	9	10

Complete Valve Catalogue sent on application.

## IRON COCKS.

VULCANIZED ASBESTOS  
PACKED.

SCREW ENDS.

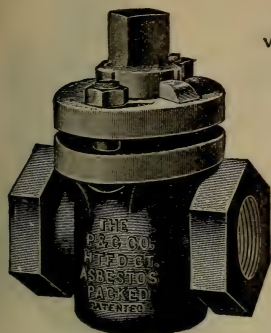


Fig. 125.

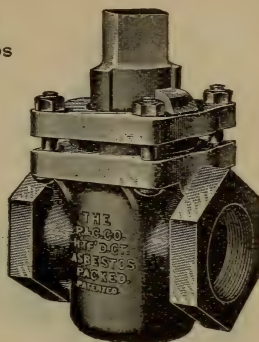


Fig. 126.

	Fig. 125.										Fig. 126.							
Size .....	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2		2 1/2	3	3 1/2	4	4 1/2	5	6	
Price, Figs. 125 and 126.....	1.30	1.30	1.45	1.60	2.10	2.50	3.50	4.75	7.00	12.00	18.00	27.00	30.00	....	45.00	60.00		
Distance End to End.....	2 3/8	2 3/8	2 3/8	3	3 3/8	4	4 3/8	5 1/8	6	7	8 1/8	8 3/8	9 1/8	....	11 1/8	14 3/8		



Fig. 127.

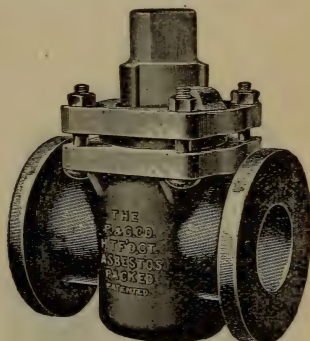


Fig. 128.

	Fig. 127.					Fig. 128.							
Size .....	1	1 1/4	1 1/2	2		2 1/2	3	3 1/2	4	4 1/2	5	6	
Price, Figs. 127 and 128.....	2.50	3.50	4.75	7.00	12.00	18.00	27.00	30.00	....	45.00	60.00		
Distance Face to Face .....	5 1/4	5 3/4	5 3/4	7 1/4	8 1/4	9 1/4	10 1/4	11 1/2	....	13 3/4	16		
Diameter of Flanges.....	4	4 1/2	5	6	7	7 1/2	8 1/2	9	....	10	11		

Complete Valve Catalogue sent on application.

# HEAVY IRON COCKS.

VULCANIZED ASBESTOS  
PACKED.

SCREW ENDS.

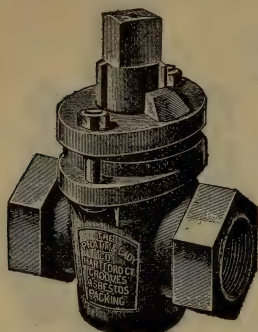


Fig. 250.

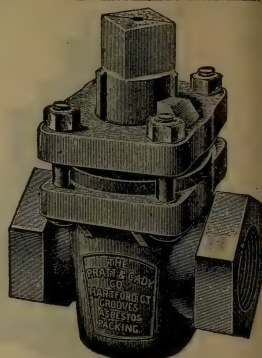


Fig. 251.

Fig. 250.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 250 and 251...	1.50	1.75	2.00	2.50	3.00	4.25	5.75	8.50	14.50	21.50	32.50	36.00
Distance End to End....	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$	6%	$8\frac{3}{4}$	$8\frac{3}{4}$	$9\frac{1}{4}$	$11\frac{3}{4}$

Fig. 251.

## FLANGE ENDS.

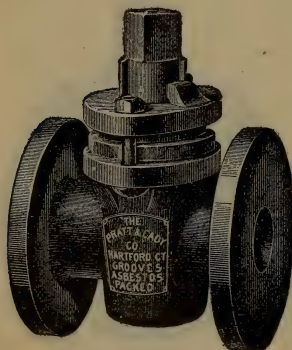


Fig. 353.

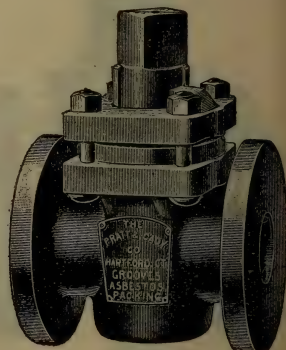


Fig. 354.

Fig. 353.

Size.....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 353 and 354.....	3.00	4.25	5.75	8.50	14.50	21.50	32.50	36.00
Distance Face to Face.....	$5\frac{1}{2}$	$5\frac{3}{4}$	$6\frac{1}{4}$	$7\frac{1}{4}$	$8\frac{3}{4}$	$10\frac{1}{4}$	$11\frac{1}{4}$	$12\frac{1}{4}$
Diameter of Flanges.....	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	9	9	10

Fig. 354.

Complete Valve Catalogue sent on application.



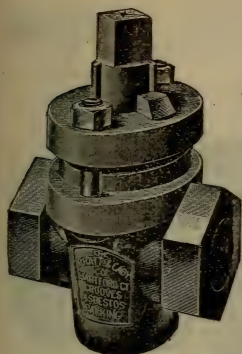


Fig. 252.

**EXTRA HEAVY  
IRON COCKS.**  
VULCANIZED ASBESTOS  
PACKED.  
SCREW ENDS.

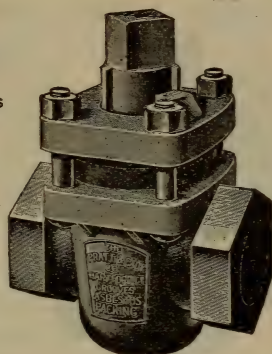


Fig. 131.

	Fig. 252.						Fig. 131.			
Size .....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 252 and 131.....	2.40	3.00	3.50	5.00	6.75	10.00	17.00	26.00	38.00	42.00
Distance End to End.....	$3\frac{3}{4}$	$4\frac{1}{8}$	$4\frac{3}{4}$	$5\frac{1}{8}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$8\frac{3}{4}$	$10\frac{1}{8}$	12	15

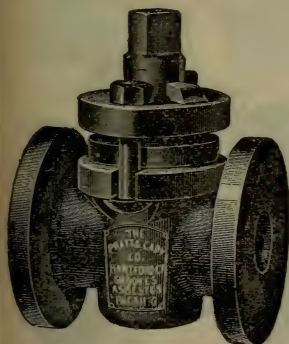


Fig. 355.

**FLANGE ENDS.**

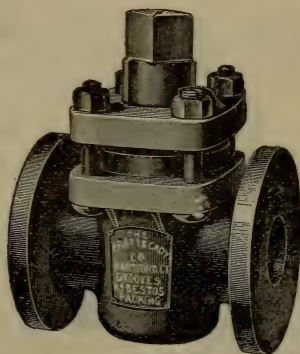


Fig. 132.

	Fig. 355.				Fig. 132.			
Size .....	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Price, Figs. 355 and 132.....	3.50	5.00	6.75	10.00	17.00	26.00	38.00	42.00
Distance Face to Face.....	$4\frac{1}{8}$	$5\frac{1}{8}$	$6\frac{1}{4}$	8	$9\frac{1}{4}$	$11\frac{1}{2}$	$12\frac{3}{4}$	15
Diameter of Flanges.....	$4\frac{1}{2}$	5	6	$6\frac{1}{2}$	$7\frac{1}{2}$	9	9	10

## IRON COCKS.

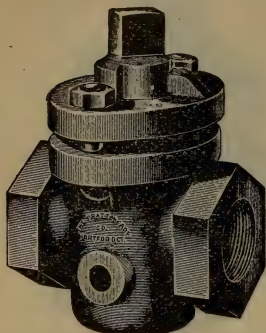
VULCANIZED ASBESTOS  
PACKED.

Fig. 135.

STOP AND WASTE—SCREW ENDS.

Size.....	½	¾	1	1¼	1½	2
Price, Fig. 135....	1.60	2.10	2.50	3.50	4.75	7.00
Distance						
End to End	2½	3¾	4	4½	5½	6

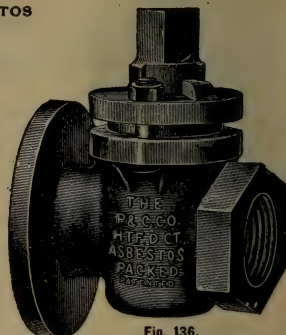


Fig. 136.

ONE FLANGE END, ONE SCREW END.

Size.....	1	1¼	1½	2	2½	3	3½	4	5	6
Price, Fig. 136....	2.50	3.50	4.75	7.00	12.00	18.00	27.00	30.00	45.00	60.00
Distance										
Flg. to End	4¾	5¼	5½	6½	7½	8½	9½	10½	12½	15¾
Diameter										
Flange.....	4	4½	5	6	7	7½	8½	9	10	11

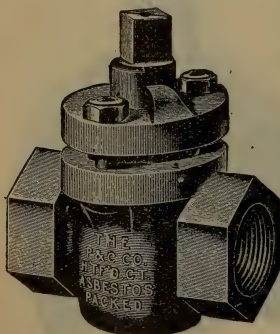


Fig. 129.

SCREW ENDS.

Size.....	1	1¼	1½	2	2½	3
Price, Fig. 129...	3.50	4.75	7.00	12.00	18.00	27.00
Dist. End to End	4¾	4¾	6	7	8½	8¾

## IRON COCKS.

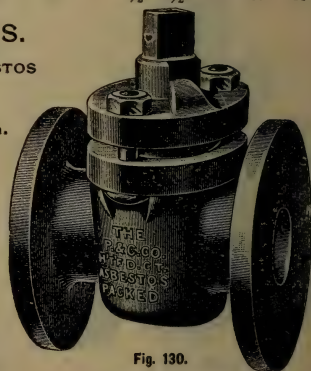
VULCANIZED ASBESTOS  
PACKED.For  
Superheated Steam.

Fig. 130.

FLANGE ENDS.

Size.....	1	1¼	1½	2	2½	3
Price, Fig. 130...	3.50	4.75	7.00	12.00	18.00	27.00
Distance						
Face to Face...	6	6½	7½	8¼	9¼	10¾
Diam. Flanges..	4½	5	6	6½	7½	9

Complete Valve Catalogue sent on application.



Globe Valve.

## LUNKENHEIMER MEDIUM PATTERN REGRINDING VALVES.

### SCREW ENDS. BRASS.

These valves are made in Globe, Angle or Cross Patterns, and are suitable for working pressures up to 200 pounds per square inch. They are heavy in pattern, made of gun metal, well designed and very durable. When leaky, the seat bearing can be reground and valve made tight and as good as new without removing valve body from connecting pipes. All valves carefully tested and fully guaranteed.

To REGRIND, unscrew the union ring, take trimming from body and place a little powdered sand and soap on the disc. Insert a wire through hole in disc to secure it to the stem, then replace trimming and reground, leaving the ring unscrewed so that the hub rotates in the body and guides the stem while regrounding.



Angle Valve.

Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Globe Valves, Brass... Each	.70	.70	.85	1.15	1.45	2.00	2.80	3.90	6.20	12.00	16.50	29.00	42.00
Angle Valves, Brass... Each	.70	.70	.85	1.15	1.45	2.00	2.80	3.90	6.20	12.00	16.50	29.00	42.00
Cross Valves, Brass... Each	1.00	1.00	1.00	1.50	2.00	2.70	3.50	5.10	8.00	16.00	24.00	35.00	50.00
Globe or Angle Valves, Finished all over with Fin. Brass Wheel, Brass... Each	1.75	1.90	2.15	2.50	3.10	3.65	5.25	7.25	10.75	22.00	33.50	.....	.....
Cross Valves, Fin. all over w. Fin. Brass Wheel, Brass, Each	2.40	2.60	2.90	3.30	4.20	4.90	7.00	9.70	14.30	29.30	44.70	.....	.....

## LUNKENHEIMER MEDIUM PATTERN REGRINDING CHECK VALVES.

Horizontal  
Check Valve.Angle  
Check Valve.Vertical  
Check Valve.

### SCREW ENDS.

### BRASS.

These valves have been designed to overcome defects found in other makes. The discs are guided both top and bottom and will always seat properly and not stick or pound. Quick and positive in action.

Size	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Check Valves, Horiz., Angle or Vertical... Each	.50	.50	.60	.85	1.15	1.55	2.30	3.25	5.20	10.00	14.00



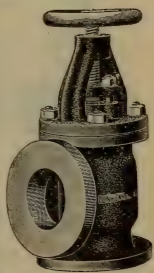
Sectional.

## LUNKENHEIMER IRON-BODY ANGLE BLOW-OFF VALVES.

The Lunkenheim Iron-Body Blow-off Valves are of heavy pattern, well made in every particular, and guaranteed for working pressures up to 250 pounds per square inch. All parts are made of iron, excepting the stem, disc lock nut, disc plug and seat ring, which are made of bronze, while the reversible bearing faces in the iron disc are filled with Babbitt metal.

Reference to the sectional illustration will show that the disc is solid and fits closely in the barrel of the valve shell, so as to prevent scale and sediment from becoming entrapped on top of disc, thereby preventing it from being readily raised when necessary. The disc is reversible, having two valve or seating faces which can be changed at will, thereby increasing the durability and efficiency of the valve considerably. These valve or seating faces in the disc consist of dovetailed slots, which are filled with Babbitt metal, and when both are cut or worn out the old Babbitt metal can be melted out and new

metal poured into the slots, and same can be faced off, thus renewing the principal wearing parts of the valve. The brass seat ring in the body of the valve can also be renewed when cut or worn.



Flange Ends.

Size	Inches	2	2 1/2	3
Screw Ends	Each	18.50	18.20	27.50
Screw and Flange Ends	Each	14.40	19.20	28.60
Flange Ends	Each	15.00	20.00	30.00



# LUNKENHEIMER REGRINDING RADIATOR VALVES.



Female Ends.



Male and Female Ends.



With Union.

Lunkenheim Regrinding Radiator Valves are constructed on the same principle as their Regrinding Globe Valves. They make very neat and durable valves for radiators, can be reground when worn and cost less than composition disc valves. All radiator valves are provided with patent "Unbreakable" Wood Handles.

## Wood Wheel, T Handle or Lock Shield.

Size.....	Inches	1/2	3/4	1	1 1/4	1 1/2	2
Fig. 430, Rough Body.....	Each	1.35	1.60	2.25	3.25	4.50	7.00
Fig. 420, Rough Body, Nickel Plated Trimmings.....	Each	1.55	1.85	2.50	3.50	4.80	7.50
Fig. 420, Rough Body, Nickel Plated all over.....	Each	1.65	1.95	2.65	3.70	5.00	7.75
Fig. 420, Finished Body.....	Each	1.85	2.15	2.85	4.00	5.50	8.50
Fig. 420, Finished Body, Nickel Plated all over.....	Each	2.15	2.50	3.25	4.45	6.00	9.25
Fig. 421, Rough Body.....	Each	1.45	1.70	2.35	3.35	4.60	7.10
Fig. 421, Rough Body, Nickel Plated Trimmings.....	Each	1.65	1.95	2.60	3.60	4.90	7.60
Fig. 421, Rough Body, Nickel Plated all over.....	Each	1.75	2.05	2.75	3.80	5.10	7.85
Fig. 421, Finished Body.....	Each	1.95	2.25	2.95	4.10	5.60	8.60
Fig. 421, Finished Body, Nickel Plated all over.....	Each	2.25	2.60	3.35	4.55	6.10	9.35
Fig. 422, Rough Body, with Union.....	Each	2.05	2.45	3.25	4.50	6.50	10.00
Fig. 422, Rough Body, Nickel Pl'd Trimmings, w. Union, Each	Each	2.30	2.75	3.50	4.85	6.90	10.50
Fig. 422, Rough Body, Nickel Plated all over, with Union, Each	Each	2.40	2.85	3.65	5.05	7.10	10.85
Fig. 422, Finished Body, with Union.....	Each	2.55	3.00	3.85	5.25	7.50	11.50
Fig. 422, Finished Body, Nickel Plated all over, w. Union, Each	Each	2.90	3.40	4.30	5.80	8.10	12.35

Keys for Lock Shield Valves, 12 cents each net.

When ordering Radiator Valves, always designate Threads, Style and Finish, also if wanted with Wood Wheel, T Handle or Lock Shield. Unless otherwise specified, valves will be sent with Wood Wheels.

## LUNKENHEIMER DOUBLE-SEATED "CLIP" GATE VALVE.

IRON BODY BRASS MOUNTED AND ALL IRON.  
For 100 Pounds Working Pressure.  
SCREW OR FLANGE ENDS.



Screw Ends.




Sectional.

Size.....	Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Iron Body Brass Mounted, Screw Ends.....	Each	1.50	1.90	2.50	3.50	5.00	7.50	12.00	15.00	18.00	20.00	23.00	25.00	30.00
Iron Body Brass Mounted, Flange Ends.....	Each	.....	.....	.....	.....	8.50	13.50	16.90	20.30	22.50	26.00	28.30	33.80	.....
All Iron, Screw Ends, Ea.	.....	1.50	1.90	2.50	3.50	5.00	7.50	12.00	15.00	18.00	20.00	23.00	25.00	30.00
All Iron, Flange Ends, Ea.	.....	.....	.....	.....	.....	8.50	13.50	16.90	20.30	22.50	26.00	28.30	33.80	.....


This valve is simple in construction, compact in design, strong, well made and very durable. The valve has a single disc, and being double seated takes pressure from either side. All bearing parts, i. e., stem, disc, seats and stuffing box, are made of bronze and the hub and body of iron. Each valve is carefully tested and warranted in every respect.



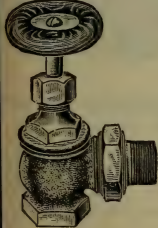
**"HESTERBERG" BRASS VALVES.****STANDARD PATTERN.****GLOBE, ANGLE AND CHECK VALVES.**


Size..... Inches	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
Globe Valves.....each	.72	.72	.77	1.00	1.26	1.80	2.52
Angle Valves....."	.72	.72	.77	1.00	1.26	1.80	2.52
Hov. Check Valves, ..	.65	.65	.70	.90	1.15	1.60	2.25


Size..... Inches	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4
Globe Valves.....each	3.50	5.30	10.00	14.40	26.50	36.00
Angle Valves....."	3.50	5.30	10.00	14.40	26.50	36.00
Hov. Check Valves.. "	3.15	4.75	9.00	13.00	24.00	32.50

**RADIATOR VALVES.****JENKINS DISC.****STEAM METAL.****PLAIN.****WOOD OR TEE HANDLE.**


Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough Body Plain.....each	2.00	2.50	3.20	4.50	6.25	10.50
" " N. P. Trim'gs. ...."	2.25	2.70	3.50	4.75	6.50	10.75
" " N. P. all over .. "	2.50	2.85	3.65	4.90	6.75	11.00
Finished all over .....	2.50	3.05	3.80	5.25	7.25	12.00
" and N.P. all over.. "	3.00	3.40	4.25	5.65	7.75	12.50

**WITH UNION.**


Size.....Inches	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Rough Body Plain.....each	2.75	3.50	4.30	5.85	7.75	12.60
" " N. P. Trim'gs. ...."	3.00	3.75	4.65	6.25	8.00	12.85
" " N. P. all over .. "	3.20	3.80	4.75	6.40	8.10	13.10
Finished all over....."	3.25	4.05	4.80	6.60	8.75	14.10
" and N.P. all over.. "	3.70	4.35	5.40	7.15	9.10	14.60

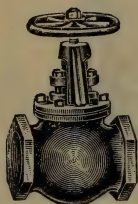
**BRASS GATE VALVES.****STANDARD PATTERN.****STEAM METAL.**


Size..... Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1
Each.....	1.00	1.00	1.20	1.75	2.50
Size..... Inches	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Each.....	3.50	5.00	7.50	14.00	20.00

ALL VALVES ARE CAREFULLY TESTED.

## "HESTERBERG" IRON BODY VALVES.

### GLOBE AND ANGLE VALVES WITH YOKE



Size.....Inches	2	2½	3	3½	4	4½	5
Screw End.....Each	7.00	9.00	12.50	15.25	19.00	24.00	27.00
Flanged....."	8.60	10.75	15.00	18.50	22.50	27.50	31.00
Size.....Inches	6	7	8	10	12	14	16
Screw End.....Each	37.50	63.00	72.00	114.00	170.00		
Flanged.....	42.00	68.00	77.00	123.00	187.00	350.00	475.00

### BRASS MOUNTED.

Size.....Inches	1	1¼	1½	2	2½	3
Screw End.....Each	2.25	2.75	3.50	5.40	7.35	9.80
Flanged....."	3.25	3.85	4.80	7.00	9.00	12.50

## "DOUBLE DISC" GATE VALVES.



### SCREWED.

Size.....Inches	2	2½	3	3½	4	4½
Each.....	10.00	12.00	15.00	18.00	20.00	23.00
Size.....Inches	5	6	7	8	9	10
Each.....	25.00	30.00	43.00	53.00	60.00	70.00

### FLANGED.

Size.....Inches	2	2½	3	3½	4	4½	5	6
Each.....	10.00	12.00	15.00	18.00	20.00	23.00	25.00	30.00
Size....Inches	7	8	9	10	12	14	16	
Each.....	40.00	50.00	57.00	65.00	90.00	150.00	200.00	

## "BLOW-OFF" GATE VALVES.

This valve is especially designed for Blow-off. Made from heavy pattern, strong in all its working parts. Socket of the valve can be cleaned while under pressure by opening the door at bottom of valve.

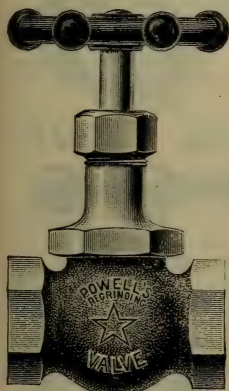
They are used in Sugar Mills, Paper Mills, Breweries, Water Works, or any place where sediment or dirt lodges in pipes or valves.



Size.....Inches	2	2½	3	3½	4
Screw End.....Each	10.50	12.30	14.75	20.00	22.50
Flanged.....Each	10.50	12.30	14.75	20.00	22.50

# POWELL'S PATENT IMPROVED Regrinding Valves.

STAR, GLOBE,  
ANGLE AND CHECK.



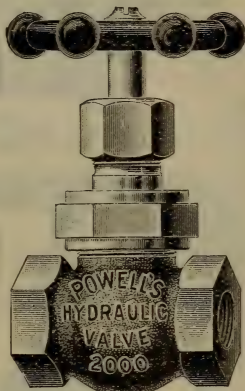
**STANDARD**

For pressures  
up to 175 lbs.

**EXTRA HEAVY**

For pressures  
up to 350 lbs.

HYDRAULIC  
GLOBE AND CHECK.



The Re-Grinding Arrangement  
Complete in Each Valve.  
One inch size and up.

Tested to 2000 pounds. If Valves  
are wanted for a higher pres-  
sure than 800 pounds please  
state, as opening through seat  
is made to suit pressure.

## PRICE LIST.

Size, Inches.....	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Star Globe and Angle Valves..	\$0 80	\$0 85	\$0 90	\$1 20	\$1 55	\$2 00	\$ 3 00	\$ 4 00	\$ 6 50	\$12 50	\$19 00
" Check Valves.....	70	70	75	95	1 20	1 65	2 50	3 25	5 00	11 00	15 00
" Extra Heavy Globe and Angle..	1 35	1 50	1 80	2 40	3 50	4 90	7 00	10 50	17 50	27 70	
" " Check Valves.....	1 25	1 40	1 60	2 15	3 10	4 40	6 20	9 50	16 00	25 00	
" Hydraulic Globe Valves.....				7 00	7 00	9 00	13 00	20 00			
" " Check Valves.....				6 00	6 00	8 00	11 00	17 00			



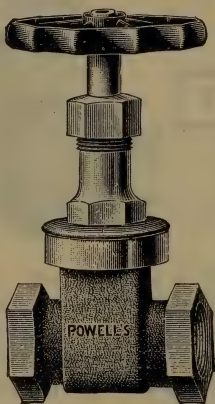
POWELL'S  
"TITAN"  
THROTTLE VALVE



POWELL'S  
PATENT  
U.S.  
THROTTLE VALVE

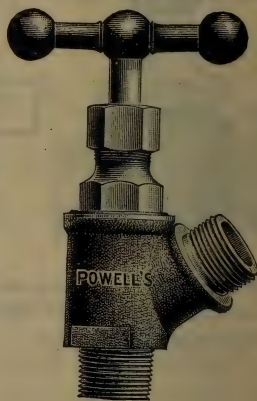
GATE VALVE——RISING STEM.

Double Disks. Self-Adjusting.  
Best Steam Metal.



Leather Disks. Chicago Pattern.  
With T-Handle.

HOSE VALVE.



**PRICE LIST—Brass.**

Size .....	Inches	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Titan Throttle Valve...Brass	.....			\$2 50	\$3 00	\$4 00	\$5 00	\$7 00	\$10 00	\$19 00	\$29 00
U. S. " " " " " " " "	.....			1 60	1 80	2 50	3 50	5 00	7 50	13 50	19 00
Standard Gate Valve.... "	.....	\$1 25	\$1 25	1 30	1 75	2 50	3 50	5 00	7 50	14 00	20 00
Hose Valve, Chicago Pattern	.....					3 15	3 70	4 75	7 00	8 50	.....

**PRICE LIST—Iron Body Throttle Valves.**

Size .....	Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	8
U. S. ....	.....	\$7 00	\$12 00	\$15 00	\$18 00	\$21 00	\$25 00	\$30 00	\$35 00	\$65 00
Titan .....	.....	13 00	16 00	20 00	25 00	30 00	.....	35 00	40 00	.....





Brass.

Size.....Inches	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	8
Brass Body..Each	1.80	2.50	3.50	5.00	7.50	13.50	19.00	40.00	60.00	.....	.....	.....	.....	.....
Iron Body Brass Mounted..Each	.....	.....	.....	.....	7.00	12.00	15.00	18.00	21.00	25.00	30.00	35.00	65.00	.....
All Iron.....Each	3.40	4.00	4.50	6.00	7.00	12.00	15.00	18.00	21.00	25.00	30.00	35.00	65.00	.....

## LUNKENHEIMER "HANDY" GATE VALVES.

(PATENTED.)

Brass, Iron Body Brass Mounted and All Iron.

The discs are secured to the operating stem and adapted to close against tapering seats in the valve shell, and being provided with ball-and-socket bearings at their backs are evenly wedged against the seats when the valve is closed by the lever. This is the only practical way to construct lever quick-opening valves, as has been found out after years of actual experience. The discs make a tight joint, will not jar open, are under perfect control of the detachable lever and will remain intact at any desired opening. Unequaled for pressures not exceeding 75 pounds.



Iron.

## LUNKENHEIMER LEVER THROTTLE VALVES.

(PATENTED.)

For 175 Lbs. Working Pressure.

This valve is especially adapted as a "Throttle" for traction engines, saw mills, etc., and wherever a compact, simple, durable and reliable quick opening valve is wanted. It may be operated by the handle or rod attachment, and is so balanced that it can be set at any desired opening. It is constructed of few parts, and therefore will not get out of order. The discs being loose and provided with ball-and-socket bearings, wear evenly and make a tight joint. The only practical manner in which to construct lever quick-opening valves is to wedge the discs between tapering seats in the valve shell by means of a ball-and-socket bearing between them. All valves are thoroughly tested before leaving the factory.

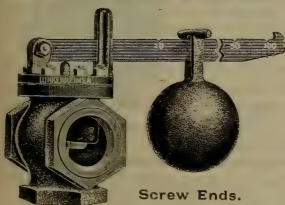


Brass Body.

Iron Body  
Brass Mounted.

Size.....Inches	3/4	1	1 1/4	1 1/2	2	2 1/2
Brass Body.....Each	3.00	4.00	5.00	7.00	10.00	19.00
IRON-Brass Mounted.						
Size.....Inches	2 1/2	3	3 1/2	4	5	6
Iron Body Brass Mounted.....Each	16.00	20.00	25.00	30.00	35.00	40.00

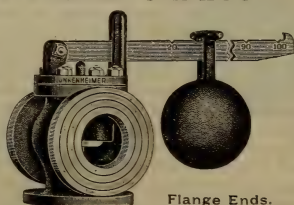
## LUNKENHEIMER IRON BODY CROSS SAFETY VALVES.



Screw Ends.

BRASS MOUNTED.

EXTRA QUALITY.

SCREW OR  
FLANGE ENDS.

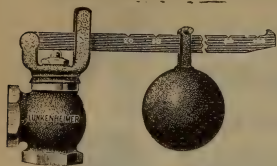
Flange Ends.

Iron Body Cross Safety Valves. Screw Ends.

Size.....Inches	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Cross Safety Valves, Screw Ends, Each	4.00	5.00	5.80	7.80	13.25	17.25	23.00	28.75	34.50	41.50	57.75
Ball Weights for above.....Pounds	8	10	15	20	30	40	50	70	85	100	140

Iron Body Cross Safety Valves. Flange Ends.

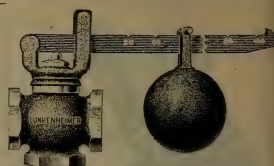
Size.....Inches	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Cross Safety Valves, Flange Ends, Each	10.25	16.00	21.50	27.50	34.00	40.00	48.00	65.00
Ball Weights for above.....Pounds	20	30	40	50	70	85	100	140



Angle Safety Valve..

## Lunkenheimer ANGLE and CROSS SAFETY VALVES.

SCREW ENDS. BRASS.



Cross Safety Valve.

Size.....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Angle or Cross Safety Valves, Each		2.50	3.25	3.90	4.70	7.15	9.00	12.50	22.50	33.00
Ball Weights for above.....	Pounds	3	3	5	8	10	15	20	30	40

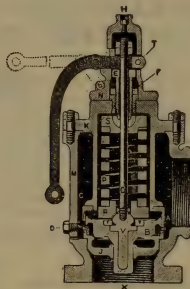
## LUNKENHEIMER POP SAFETY VALVES.

Iron Body Brass Mounted.

For Marine or Stationary Boilers.



Screw Ends.



Sectional.



Flange Ends.

It is not necessary to change the pressure adjustment when testing the boiler, as the lock screw H can be removed and a long set screw of the same size inserted and screwed down upon the valve stem holding disc to its seat while pressure is being applied to boiler. As soon as test is over the set screw can be removed and valve will again be as efficient as ever. The spring and disc are encased and action of valve can not be affected by back pressure in case discharge pipe is cramped or muffled.

For Marine purposes we furnish these valves with flanges at both side and bottom, and for stationary boilers with both ends screwed, or flanged at bottom and screwed at side. We can make these valves iron body brass mounted or entirely of gun metal and with nickel seats if required. Prices on valves of this pattern made of gun metal or iron body with nickel seats furnished upon application. In ordering, state plainly size of valve required, pressure at which it is to be set to blow off, whether wanted with flanged, screwed, or screw and flange ends and with straight or side lever. When not otherwise specified all orders will be filled with iron body valves with brass mountings, screw ends, side lever and set at 100 lbs. Full directions for operating and attaching are sent with each valve.

Size.....	Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Screw Ends.....	Each	22.00	32.00	40.00	56.00	72.00	84.00	100.00	120.00
Flange Ends.....	Each	22.00	32.00	40.00	56.00	72.00	84.00	100.00	120.00

## LUNKENHEIMER IMPROVED POP SAFETY VALVES.

For Stationary, Portable and Marine  
Steam Boilers.

TOP OR ANGLE OUTLET. BRASS.



Top Outlet.



Angle Outlet.

Lunkenheim Pop Safety Valves are heavy, made of the very best of materials, well finished in every way and have large springs, insuring great durability. They are simple in construction, thus making it impossible for them to get out of order and warranted to be reliable, accurate and of the very highest quality. They have full relieving capacity, are very sensitive and admit of being finely adjusted. All valves are provided with a lock-key attachment to guard against their being tampered with and adjustments of pop lip and pressure can be made from the outside of valve without taking it apart.

Size Pipe.....Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass, Top Outlet.....Each	5.50	6.00	6.50	7.50	9.00	11.50	18.00	28.00	38.00
Brass, Angle Outlet.....Each	6.00	6.50	7.00	8.20	9.80	12.40	19.50	30.00	41.00

## LUNKENHEIMER PLAIN PATTERN POP SAFETY VALVES.

IRON BODY BRASS MOUNTED.



Screw Ends.



Flange Ends.

This valve has been designed to meet the demand for a serviceable low-priced valve and will be found satisfactory in every particular.

The spring is of the best quality steel, carefully wound and tempered, and rests upon ball-and-socket plates at top and bottom, so that the pressure is equally divided on the disc, and can get out of line.

The pop lip can be adjusted, also the pressure-regulating nut, without taking the valve apart.

The seat and disc are made of the best bronze composition, which insures durability, and, where required, we can furnish these valves with nickel seats.

All valves have lock attachment, so as to prevent the pressure setting from being tampered with. Full directions for attaching and operating are sent with each valve.

All patterns of Lunkenheim Pop Safety Valves have been approved by the Board of Supervising Inspectors of Steam Vessels

for Marine Service at the highest rating, *i. e.*, one square inch of valve area to every three square feet of grate surface of boilers.

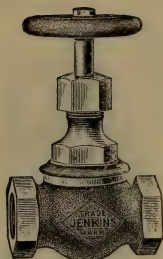
In ordering, state plainly size of valve required, pressure at which it is to be set to blow off, whether wanted with flange, screw, or screw and flange ends, and with straight or side lever. When not otherwise specified, all orders will be filled with iron-body valves with bronze mountings, screw ends, side lever, and set at 100 pounds.

Size.....Inches	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6
Screw Ends.....Each	22.00	32.00	40.00	56.00	72.00	84.00	100.00	120.00
Flange Ends.....Each	22.00	32.00	40.00	56.00	72.00	84.00	100.00	120.00
Suitable for Boilers.....H. P.	50	70	100	125	150	175	200	300

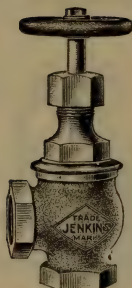
## JENKINS BROS. BRASS VALVES.

GLOBE, ANGLE AND CROSS.

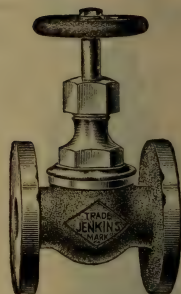
Screwed and Flanged.



GLOBE SCREWED



ANGLE SCREWED.



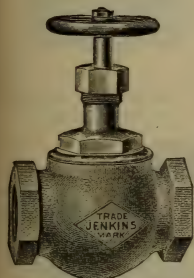
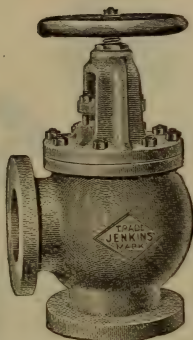
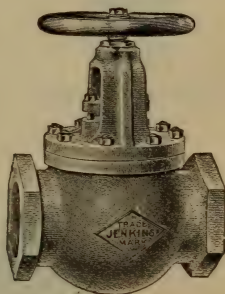
GLOBE FLANGED

Size.....	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass Globe and Angle Valves, screwed...	1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75	15.75	22.00
"    "    "    flanged....		3.50	4.00	4.00	5.00	6.00	9.00	11.00	16.50	25.00	34.00
Brass Cross Valves, screwed.....		1.70	2.00	2.25	2.50	3.25	4.75	6.25	9.50	20.00	27.50
"    "    flanged.....						8.64	11.45	15.10	22.70	32.82	44.30
Brass Hose End Globe and Angle Valves..						3.30	4.70	6.50	9.90	17.10	23.35



## JENKINS BROS. IRON BODY VALVES.

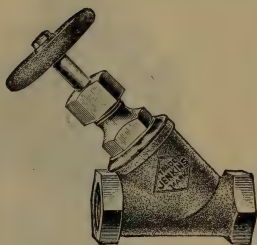
GLOBE. ANGLE AND CROSS.

GLOBE B. H.  
SCREWED.ANGLE. WITH YOKE,  
FLANGED.GLOBE. WITH YOKE.  
SCREWED.

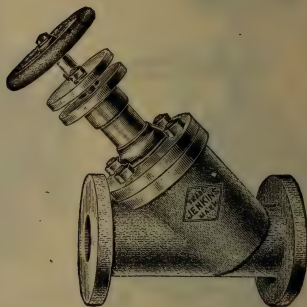
Size.....	$\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10	12
Globe and Angle Valves:																	
Brass Hub, screwed..	2.75	2.85	3.85	5.00	7.25	11.00	16.00										
"    flanged...					8.50	13.00	18.00										
With Yoke, screwed..					10.00	12.00	16.75	19.50	24.00	32.00	40.00	48.00	80.00	90.00	121.00	130.00	185.00
"    flanged...					11.75	14.00	18.50	21.50	26.00	34.00	42.00	50.00	80.00	90.00	121.00	130.00	185.00
Cross Valves, screwed..					16.00	21.00	26.00	30.00	42.00	45.00	58.00						
"    "    flanged...					19.00	24.00	29.00	33.00	45.00	48.00	62.00						
Globe and Angle Valves, with Yoke, flanged.....																	
Size.....									14		16		18		20		24
Globe and Angle Valves, with Yoke, flanged.....									334.00		400.00		540.00		620.00		1260.00

# JENKINS BROS. Y OR BLOW-OFF VALVE.

BRASS AND IRON BODY.



BRASS, SCREWED.



IRON BODY, FLANGED.

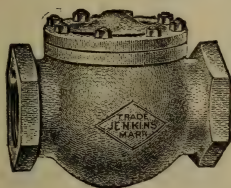
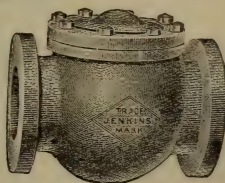
Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	8
Brass, screwed.....	2.00	3.00	4.00	5.00	6.50	9.25	18.00	25.00	.....	.....	.....	.....	.....
" flanged.....	.....	.....	8.64	10.73	12.93	19.41	28.05	36.68	.....	.....	.....	.....	.....
Iron Bdy, screwed.....	.....	.....	.....	.....	.....	10.40	14.80	20.00	28.00	35.00	58.80	70.00	115.00
" flanged.....	.....	.....	.....	.....	.....	12.40	17.40	23.00	31.00	38.40	64.00	70.00	115.00
Iron Body Y Valves, flanged, {	Diameter of flanges.....					6	7	$7\frac{1}{2}$	$8\frac{1}{2}$	9	10	11	$13\frac{1}{2}$
	Face to face or flanges.....					$8\frac{1}{2}$	11	$12\frac{1}{4}$	15	14	$16\frac{1}{2}$	$18\frac{1}{2}$	$23\frac{1}{2}$

## JENKINS BROS. CHECK VALVES.

BRASS AND IRON BODY.

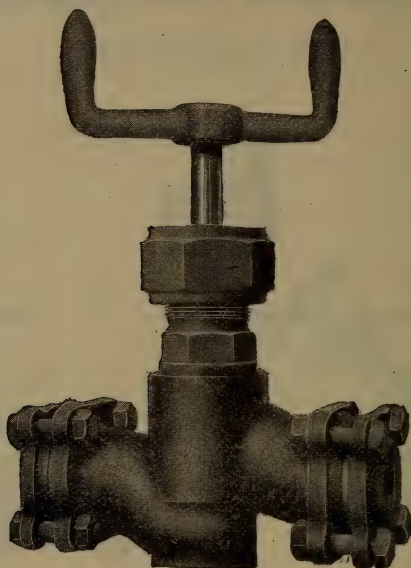
BRASS, HORIZONTAL,  
SCREWED.BRASS, ANGLE,  
SCREWED.BRASS, VERTICAL  
SCREWED.

Size.....	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2	2 $\frac{1}{2}$	4
Brass, Horizontal, Angle, and Vertical, screwed..	1.10	1.20	1.30	1.90	2.60	3.60	6.00	7.50	15.50	20.50
“ “ “ “ flanged.....	“	“	“	4.75	5.50	7.80	9.80	15.00	22.80	32.40

IRON BODY, HORIZONTAL,  
SCREWED.IRON BODY, HORIZONTAL,  
FLANGED.

Size.....	$2\frac{1}{2}$	3	3 $\frac{1}{2}$	4	5	6
Iron Body Check, screwed, Horizontal, Angle, and Vertical....	10.50	14.00	17.00	20.00	20.00	40.00
“ “ “ “ flanged, “ “ “ “ ..	12.50	16.50	20.00	23.00	33.00	43.00

## THE TRIUMPH STEEL AMMONIA VALVES



## GLOBE.

SIZE, inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
NUMBER	201	202	203	204	205	206
Face to Face, inches	$4\frac{1}{2}$	$4\frac{1}{2}$	$6\frac{1}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{1}{2}$
Height, inches	$7\frac{5}{8}$	$7\frac{5}{8}$	$9\frac{5}{8}$	$11\frac{1}{4}$	12	14
Diameter Bolt Circle, inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	4	$4\frac{5}{8}$
No. Bolts	4	4	4	8	8	8
Size Bolts, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$
Length Bolts, inches	2	2	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Price, complete	\$8 00	9 00	11 80	14 50	19 00	23 00

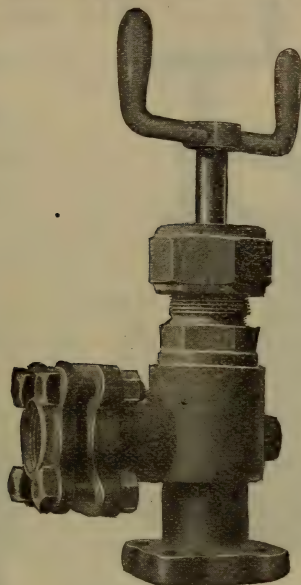
SIZE, inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
NUMBER	207	208	209	210	211	212
Face to Face, inches	$12\frac{3}{4}$	14	17	$18\frac{1}{2}$	22	26
Height, inches	17	$22\frac{1}{2}$	23	$23\frac{1}{2}$	27	32
Diameter Bolt Circle, inches	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{3}{8}$
No. Bolts	8	8	12	12	16	16
Size Bolts, inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Length Bolts, inches	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$
Price, complete	\$40 00	48 00	83 80	96 30	110 00	130 00

Add 15 per cent. to price for odd sizes.

In ordering please use Number in heavy type.



## THE TRIUMPH STEEL AMMONIA VALVES.



## ANGLE.

SIZE, inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
NUMBER	220	221	222	223	224	225
Face to Face, inches	$2\frac{1}{8}$	$2\frac{1}{8}$	$2\frac{1}{2}$	$3\frac{1}{2}$	4	4
Height, inches	$8\frac{3}{8}$	$8\frac{3}{8}$	10	$11\frac{1}{4}$	12	14
Diameter Bolt Circle, inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{5}{8}$	4	$4\frac{5}{8}$
No. Bolts	4	4	4	8	8	8
Size Bolts, inches	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$
Length Bolts, inches	2	2	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{1}{2}$
Price, complete	\$7 00	8 00	10 00	13 00	17 00	20 00

SIZE, inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
NUMBER	226	227	228	229	230	231
Face to Face, inches	5	5	$6\frac{1}{2}$	$6\frac{1}{2}$	9	10
Height, inches	16	$19\frac{1}{2}$	$22\frac{3}{4}$	$24\frac{3}{4}$	26	31
Diameter Bolt Circle, inches	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{5}{8}$
No. Bolts	8	8	12	12	16	16
Size Bolts, inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Length Bolts, inches	$3\frac{1}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	$4\frac{1}{4}$
Price, complete	\$32 00	42 00	70 50	78 40	92 00	110 00

In ordering please use number in heavy type.  
Add 15 per cent. to price for odd sizes.



## THE TRIUMPH MACHINERY STEEL VALVES.

FOR AMMONIA.

### GLOBE.

SIZE, inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
NUMBER	240	241	242	243	244	245	246
PRICE	\$2 00	10 00	14 00	21 00	24 00	30 00	48 00

### ANGLE.

SIZE, inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
NUMBER	260	261	262	263	264	265	266
PRICE	\$8 00	9 00	12 00	18 00	21 00	26 00	44 00

### CROSS.

SIZE, inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
NUMBER	280	281	282	283	284	285	286
PRICE	\$8 50	9 50	13 00	20 00	22 00	28 00	46 00

Add 15 per cent. for odd sizes.

In ordering please use number in heavy type.

## FLANGED COMBINATION STOP-COCK AND EXPANSION VALVE.



SIZE, Inches	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$
NUMBER	340	341	342	343	344	345	346
PRICE	\$30 00	35 00	54 00	70 00	80 00	100 00	125 00

# AMMONIA IRON GATE VALVES.

RENEWABLE SEAT RINGS.

Screwed Hub.



Fig. 105.

SCREW ENDS—COUNTERBORED.

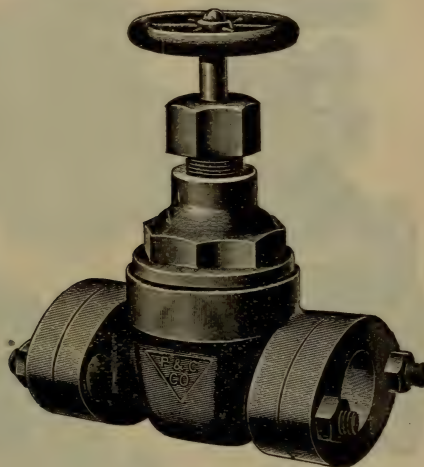


Fig. 231.

GLAND ENDS.

Size .....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Fig. 105 .....	3.00	3.00	3.00	3.60	4.20	5.10	6.00
Distance End to End .....	$3\frac{5}{8}$	$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{1}{4}$	5
Depth of Counterbore .....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Diameter of Counterbore .....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Size .....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Price, Fig. 231 .....	4.00	4.00	4.00	4.80	5.55	6.60	7.65
Distance End to End of Body .....	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{7}{8}$	$4\frac{5}{8}$	$4\frac{3}{8}$	$5\frac{3}{8}$
Depth of Counterbore .....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$
Diameter of Counterbore .....	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$

Complete Valve Catalogue sent on application.

# AMMONIA IRON GATE VALVES.

RENEWABLE SEAT RINGS.

Bolted Bonnet.

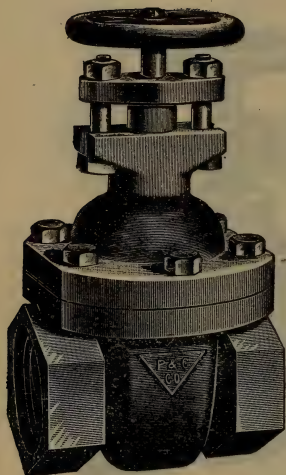


Fig. 230.

SCREW ENDS-COUNTERBORED.

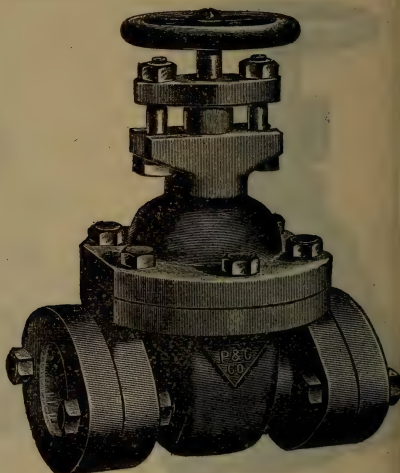


Fig. 232.

GLAND ENDS.

Size.....	2	2½	3
Price, Fig. 230.....	8.50	12.00	14.50
Distance End to End.....	6	9½	10¾
Depth of Counterbore.....	7⅞	3⅞	3⅞
Diameter of Counterbore.....	2½	3½	4½
Size.....	2	2½	3
Price, Fig. 232.....	10.45	16.20	20.50
Distance End to End of Body.....	6¼	9¾	11
Depth of Counterbore.....	7⅞	3⅞	3⅞
Diameter of Counterbore.....	3¼	3½	4½

In Fig. 232, 2½-inch and 3-inch sizes have four bolts in gland.

Complete Valve Catalogue sent on application.



# AMMONIA IRON COCKS.

VULCANIZED ASBESTOS PACKED.

Screw and Counterbored Ends.

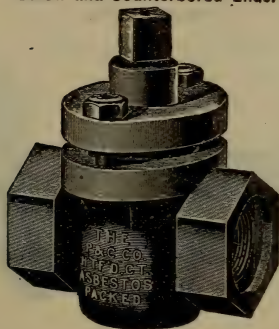


Fig. 142 1/2.

Size .....	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
Price .....	1.40	1.50	1.60	2.10	2.50	3.50	4.75	7.00
Distance End to End .....	3 1/4	3 1/4	3 3/4	4 1/4	4 3/4	5 3/4	5 3/4	6 3/4
Depth of Counterbore .....	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8
Diameter of Counterbore .....	1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	2 1/8	2 1/8	2 1/8

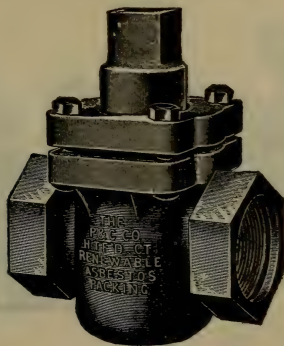


Fig. 254.

Size .....	2 1/2	3	3 1/2	4
Price .....	12.00	18.00	27.00	30.00
Distance End to End .....	7 3/4	10	10 1/4	13 3/4
Depth of Counterbore .....	3 3/8	3 3/8	3 3/8	3 3/8
Diameter of Counterbore .....	3 1/4	4 1/4	5 1/4	5 1/4

Complete Valve Catalogue sent on application.

# AMMONIA IRON COCKS:

VULCANIZED ASBESTOS PACKED.  
GLAND ENDS.

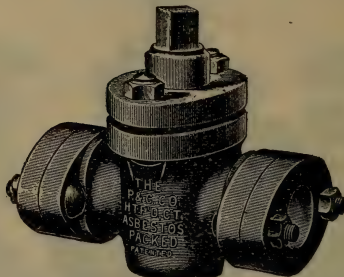


Fig. 142.

Size.....	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
Price .....	2.10	2.25	2.45	3.10	3.65	4.75	6.10	8.65
Distance End to End of Body.....	$3\frac{3}{8}$	$3\frac{3}{8}$	$3\frac{3}{8}$	$4\frac{1}{4}$	$4\frac{7}{8}$	$5\frac{5}{8}$	$6\frac{1}{4}$	$7\frac{1}{8}$
Depth of Counterbore .....	$\frac{3}{16}$	$\frac{3}{16}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{7}{16}$	$\frac{1}{2}$
Diameter of Counterbore.....	$1\frac{1}{16}$	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$2\frac{1}{8}$	$2\frac{1}{4}$	$3\frac{1}{8}$

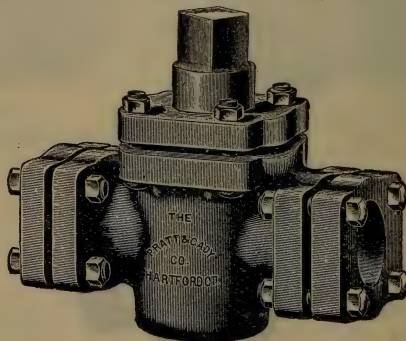


Fig. 260.

Size.....	$2\frac{1}{2}$	3
Price .....	15.50	23.00
Distance End to End of Body.....	$8\frac{3}{4}$	$10\frac{5}{8}$
Depth of Counterbore .....	$8\frac{1}{16}$	$4\frac{1}{8}$
Diameter of Counterbore.....	$8\frac{1}{16}$	$4\frac{1}{8}$

Complete Valve Catalogue sent on application.

# AMMONIA IRON CHECK VALVES.

STRAIGHTWAY SWINGING.

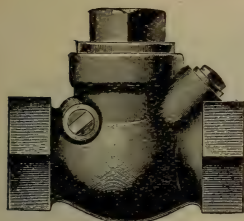
Rotating Disc, Screw Ends,  
Counterbored.

Fig. 97.

SCREWED CAP.

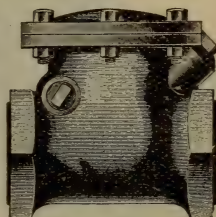


Fig. 197.

BOLTED CAP.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 97.....	1.95	2.10	2.25	2.75	3.50	4.25	....	....
Distance End to End.....	4	$4\frac{1}{4}$	$5\frac{1}{2}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	....	....
Price, Fig. 197.....	....	....	....	....	....	4.25	9.50	12.00
Distance End to End.....	....	....	....	....	....	5	$7\frac{3}{8}$	8

## GLAND ENDS.

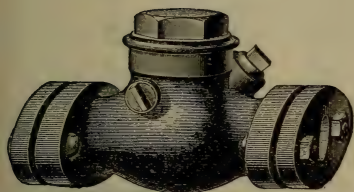


Fig. 98.

SCREWED CAP.

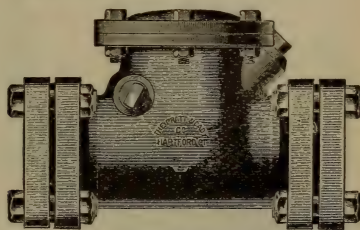


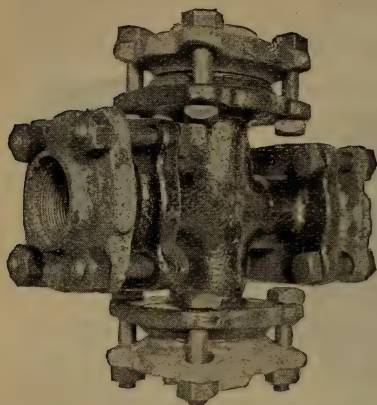
Fig. 198.

BOLTED CAP.

Size.....	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Price, Fig. 98.....	2.80	3.10	3.40	4.00	4.85	5.90	....	....
Distance End to End of Body.....	$4\frac{1}{2}$	$5\frac{5}{8}$	$6\frac{1}{4}$	$6\frac{5}{8}$	$7\frac{1}{4}$	$7\frac{1}{2}$	....	....
Price, Fig. 198.....	....	....	....	....	....	5.90	13.00	17.00
Distance End to End of Body.....	....	....	....	....	....	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$

Fig. 198, 2-inch size has two bolts in gland.

Complete Valve Catalogue sent on application.



## THE TRIUMPH STEEL AMMONIA FITTINGS.

### CROSSES.

SIZE, Inches .....	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
NUMBER .....	<b>320</b>	<b>321</b>	<b>322</b>	<b>323</b>	<b>324</b>	<b>325</b>
Face to Face, inches .....	4	4	$4\frac{3}{4}$	6	8	8
Size Bolts, inches .....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$
No. Bolts .....	8	8	8	16	16	16
Length Bolts, inches .....	2	2	2	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Diameter Bolt Circle, inches .....	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	4	$4\frac{5}{8}$
Price, complete .....	\$1 00	4 50	5 10	7 20	9 80	12 00

SIZE, inches .....	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5
NUMBER .....	<b>326</b>	<b>327</b>	<b>328</b>	<b>329</b>	<b>330</b>
Face to Face, inches .....	$9\frac{1}{4}$	10	12	13	18
Size Bolts, inches .....	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
No. Bolts .....	16	16	24	24	32
Length Bolts, inches .....	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	4
Diameter Bolt Circle, inches .....	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$
Price, complete .....	\$19 20	22 90	33 80	37 80	48 00

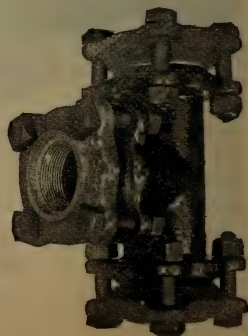
### ELBOWS.

SIZE, inches .....	$\frac{1}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
NUMBER .....	<b>300</b>	<b>301</b>	<b>302</b>	<b>303</b>	<b>304</b>	<b>305</b>
Face to Face, inches .....	4	4	$4\frac{3}{4}$	6	8	8
Center to Face, inches .....	2	2	$2\frac{3}{8}$	3	4	4
Size Bolts, inches .....	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$
No. Bolts .....	6	6	6	12	12	12
Length Bolts, inches .....	2	2	2	$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$
Diam. Bolt Circle, inch .....	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	4	$4\frac{5}{8}$
Price, complete .....	\$3 50	3 80	4 20	5 60	7 00	10 30

SIZE, inches .....	$2\frac{1}{4}$	3	$3\frac{1}{2}$	4	5	6
NUMBER .....	<b>306</b>	<b>307</b>	<b>308</b>	<b>309</b>	<b>310</b>	<b>311</b>
Face to Face, inches .....	$9\frac{1}{4}$	10	12	13	18	20
Center to Face, inches .....	$4\frac{3}{8}$	5	6	$6\frac{1}{2}$	9	10
Size Bolts, inches .....	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
No. Bolts .....	12	12	18	18	24	24
Length Bolts, inches .....	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{3}{4}$	4	4	$4\frac{1}{4}$
Diam. Bolt Circle, inch .....	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{5}{8}$
Price, complete .....	\$14 30	18 20	25 70	28 90	40 00	60 00

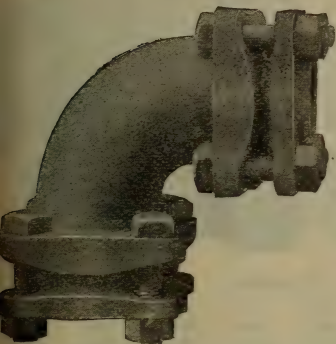
Add 15 per cent. to price for odd sizes.

In ordering please use Number in heavy type.





## THE TRIUMPH STEEL AMMONIA FITTINGS.



## ELBOWS.

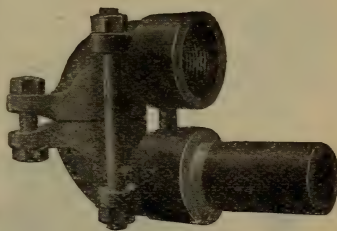
SIZE, inches.....	1¼	1½	1¾	1½	2
NUMBER .....	<b>340</b>	<b>341</b>	<b>342</b>	<b>343</b>	<b>344</b>
Center to Face, inch.	2½	2½	2½	3½	4½
Size Bolts, inches...	½	½	¾	½	¾
No. Bolts.....	4	4	4	8	8
Length Bolts, inches.	2	2	2	2½	2¾
Dia. Bolt Circle, inch.	2¾	2¾	3½	4	4¾
Price, complete .....	\$2 50	2 50	3 60	4 00	5 90

SIZE, inches.....	2½	3	3½	4	5	6
NUMBER .....	<b>345</b>	<b>347</b>	<b>348</b>	<b>349</b>	<b>350</b>	<b>351</b>
Center to Face, inch.	4½	5	6	6½	9	10
Size Bolts, inches...	¾	¾	¾	¾	¾	¾
No. Bolts.....	8	8	12	12	16	16
Length Bolts, inches	3½	3½	3¾	4	4	4¼
Dia. Bolt Circle, inch.	5¾	6	6¾	7½	8½	9½
Price, complete...	\$10 20	14 00	19 00	25 00	30 00	36 00

## RETURN BENDS.

SIZE, inches.....	1¼	1¼	1¼	1¼	2
CENTER, inches.....	8	4	5	6	4
NUMBER .....	<b>380</b>	<b>381</b>	<b>382</b>	<b>383</b>	<b>384</b>
No. Bolts.....	2	2	4	4	2
Length Bolts, inches.	2½	2½	2½	2½	2½
No. Studs.....	2	2	..	..	2
Length Stud, inches.	5½	6¾	..	..	7½
Size, inches.....	¾	¾	¾	¾	¾
Height per Pr., inch.	5¾	6½	7½	8½	8¼
Length per Pr., inch.	5¾	5¾	5½	6½	6¾
Width per Pr., inch.	4	4	4	4	5
Price per pair .....	\$3 80	4 10	5 00	5 50	5 00

SIZE, inches.....	2	2	2	2
CENTER, inches.....	5	6	7	8
NUMBER .....	<b>385</b>	<b>386</b>	<b>387</b>	<b>388</b>
No. Bolts.....	2	4	4	4
Length Bolts, inches.	2¾	2¾	2¾	2¾
No. Studs.....	2	..	..	..
Length Studs, inches	5	..	..	..
Size, inches.....	¾	¾	¾	¾
Height per Pr., inches	9¼	10¼	11¼	12¼
Length per Pr., inches	6¾	6¾	6¾	6¾
Width per Pr., inches.	5	4¾	4¾	4¾
Price per Pair .....	\$6 50	7 00	7 50	8 00



## PRICES

OF SOLID RETURN BENDS  
ON APPLICATION.

Add 15 per cent. to price for odd sizes.  
In ordering please use Number in heavy type.

## THE TRIUMPH STEEL AMMONIA FLANGES.



### DROP FORGED STEEL FLANGES.

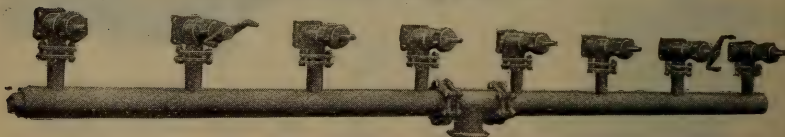
SIZE, inches	$\frac{3}{4}$	$\frac{1}{2}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2
NUMBER	<b>360</b>	<b>361</b>	<b>362</b>	<b>363</b>	<b>364</b>	<b>365</b>
Height, inches	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$5\frac{1}{2}$	6
Diameter Bolt Circle, inches	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{3}{8}$	4	$4\frac{5}{8}$
No. Bolts	2	2	2	4	4	4
Size Bolts, inches	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$
Length Bolts, inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$2\frac{1}{2}$	2	$2\frac{1}{2}$	$2\frac{1}{2}$
Price, complete	\$1 20	1 30	1 60	1 90	2 20	2 80

SIZE, inches	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6
NUMBER	<b>366</b>	<b>367</b>	<b>368</b>	<b>369</b>	<b>370</b>	<b>371</b>
Height, inches	7	$7\frac{3}{8}$	$8\frac{3}{8}$	$8\frac{7}{8}$	$10\frac{1}{4}$	$11\frac{3}{8}$
Diameter Bolt Circle, inches	$5\frac{3}{8}$	6	$6\frac{3}{4}$	$7\frac{1}{4}$	$8\frac{1}{2}$	$9\frac{5}{8}$
No. Bolts	4	4	6	6	8	8
Size Bolts, inches	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{3}{4}$
Length Bolts, inches	$3\frac{1}{2}$	$3\frac{3}{4}$	4	4	$4\frac{1}{2}$	5
Price, complete	\$4 50	5 50	7 90	8 20	10 00	12 00

Add 15 per cent. to price for odd sizes.

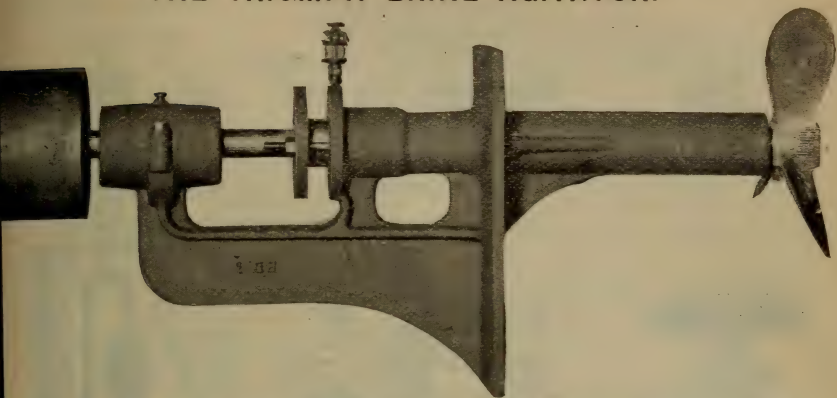
In ordering please use Number in heavy type.

### HEADERS—AMMONIA

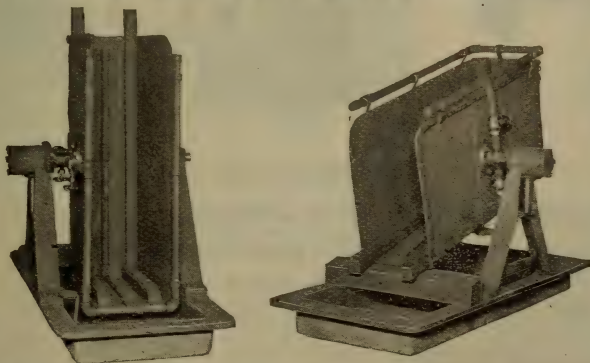


These Headers are all made of double, extra heavy wrought-iron pipe. Ends are closed with machine steel plugs or welded. All nipples are screwed and soldered into same. Each hole is recessed so that there are no threads exposed whatever. Guaranteed to be the best constructed Header made.

Prices of Screwed Fittings on application.

**THE TRIUMPH BRINE AGITATOR.**

The Propeller, as shown in the above cut, has shaft propeller made of the best Bronze metal, with three bearings fitted with ring oilers. Bearings are of double-brace make. The Propeller is used to agitate brine; it is operated by small engine or electric motor, and takes the place of brine-circulating pump. Propeller can be operated at one-third the cost of either duplex or centrifugal pump, and is a much better Agitator.

**THE TRIUMPH AUTOMATIC ICE DUMP.**

This Automatic Ice Dump is so constructed that when the same is tilted the three-way valve turns on the water, which comes in contact with all sides as well as the bottom of the can. The valves are so regulated that the bottom of the can will receive the most water, thereby melting the ice away from bottom of can, when the cake will fall on side of can, and with the aid of the air that rushes in over top of cake, will slide out and into storage room.

This Dump is guaranteed to be the most practical on the market.

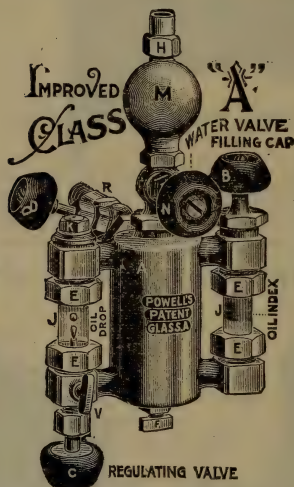
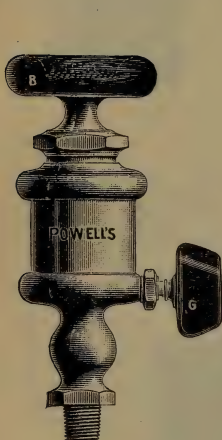
Plain  
LUBRICATOR.

POWELL'S PATENT  
CLASS "A"  
Star Sight "Up-Feed"  
LUBRICATOR.  
DOUBLE CONNECTION.

POWELL'S PATENT  
CRESCENT  
Sight "Up-Feed"  
LUBRICATOR.  
SINGLE CONNECTION.

Fig.

Fig. 488.



Handsome Patterns. Neat Designs.

This Lubricator is constructed to attach either to a vertical steam pipe at the side as shown, or by the use of an elbow and nipple can be attached to horizontal pipe or directly onto the steam chest.

Never fail to operate. Guaranteed to please the most exacting.

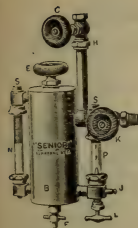
PRICE LISTS.

PLAIN LUBRICATOR, Diam Body .	1	1¼	1½	1¾	2	2¼	2½	3	3½	4
Size of Shank, Pipe Thread....	¼	⅜	⅜	¾	½	½	¾	¾	¾	¾
Price, Each .....	\$2 00	\$2 20	\$2 40	\$2 60	\$2 90	\$3 25	\$3 75	\$1 75	\$7 00	\$10 00
CLASS "A" Star Lubricator, Capacity.....										
Price, Each.....	Finished									
.....	Nickel Plated									
	1/4 pt.	1/2 pt.	3/4 pt.	1 pt.	1 qt.	1/2 gal.	1 gal.			
	\$5 60	\$7 00	\$8 00	\$8 75	\$11 25	\$16 25	\$26 00			
	6 25	7 50	8 50	9 50	12 50	17 50	33 00			
CRESCENT Lubricator, Capacity, pints .....										
Size of attaching Shank, Pipe Thread.....	1/8	¼	⅓	½	1					
Price, Bronze Finish .....	\$3 75	\$4 90	\$4 25	\$5 25	\$7 50					

Special Circulars mailed on application.



## LUNKENHEIMER IMPROVED "SENIOR" SIGHT-FEED LUBRICATOR.



"Senior."

### Double Connection.

Size	1/4 Pt	1/2 Pt	3/4 Pt	1 Pt	1 1/2 Pt	1 Qt	1/2 Gal	1 Gal
Suitable for Engine Cylinders	Up to 4 Inches	4 to 6 Inches	6 to 10 Inches	10 to 14 Inches	14 to 18 Inches	18 to 24 Inches	24 to 30 Inches	30 Up From
Shanks, Pipe Thread.....Inch	3/8	3/8	3/8	1/2	1/2	1/2	1/2	1/2
Finished Brass.....Each	12.00	15.00	17.00	20.00	22.00	25.00	28.00	35.00
Nickel Plated.....Each	13.50	17.00	19.00	22.50	25.00	28.50	32.00	43.00
Condensor Connections, Brass Tubing, Angle Valve, Each	.60	.70	.80	1.00	1.20	1.40	1.50	1.70
Condensor Connections, Brass Tubing and Angle Valve, Nickel Plated..... Each	.70	.80	.90	1.15	1.40	1.60	1.70	2.00
Length of Condensor Pipes necessary.....Inches	15	18	24	30	36	42	48	72

Lubricators are sent without Condensor Pipes and Angle Valves unless otherwise ordered.

## LUNKENHEIMER "JUNIOR" SINGLE CONNECTION SIGHT-FEED LUBRICATOR.

For Traction Engines, Steam and Air Brake Pumps, Etc.



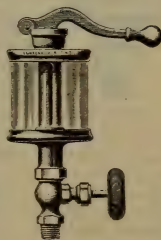
"Junior."

Size	1/4 Pint	1/2 Pint	1 Pint
Shank Pipe Thread.....Inch	3/8	3/8	1/2
Partly Finished.....Each	7.00	8.00	10.00
All Finished (Brass Condensors and Pipes and Wood Handles) Each	8.50	10.00	12.00
All Finished and Nickel Plated (Brass Condensors and Pipes and Wood Handles).....Each }	10.00	11.50	13.50

## LUNKENHEIMER GLASS BODY OIL PUMP.

The Lunkenheim Glass Body Oil Pump is easily filled and operated and is intended to be used in connection with sight-feed lubricators on stationary or marine engines. No large engine should be without a cup of this kind as an auxiliary to the sight-feed lubricator.

Size	3	5	6	8
Outside Diameter of Glass.....Inches	2 1/4	3	3 1/2	4 1/4
Height of Glass.....Inches	2 1/2	3	4	5
Capacity	1/2 Pint	1/2 Pint	1 Pint	1 Quart
Shank Pipe Thread.....Inch	3/8	3/8	1/2	1/2
Finished Brass.....Each	7.50	8.50	10.00	15.00
Nickel Plated.....Each	8.25	9.50	11.00	16.50
Extra Glasses.....Each	.15	.35	.65	1.50
Extra Cork Washers..... Per Dozen	.45	.60	.75	1.50



## LUNKENHEIMER SCALE REMOVING AND PREVENTING "STANDARD" BOILER OIL INJECTOR.

**FOR STEAM BOILERS.**



"Standard."

The "Standard" Boiler Oil Injector is intended to be attached to the feed-water pipe of steam boilers to feed boiler oil into same, which effectually removes existing incrustations and prevents the formation of new scale; also preventing foaming, pitting and leaky joints. Many boiler explosions are caused by the weakening of the iron from strains due to unequal expansion. This unequal expansion is directly caused by the scale on the heating surface, also burning and blistering same. By accurate tests a scale  $\frac{1}{32}$  of an inch requires 9 per cent. more fuel; a scale  $\frac{1}{16}$  of an inch 12 per cent.; a scale  $\frac{1}{8}$  of an inch 30 per cent., and a scale  $\frac{1}{4}$  of an inch 60 per cent., and as the scale thickens the ratio increases. Thus it will be seen that by keeping the boiler clean and free from scale, an enormous saving is effected. A GOOD QUALITY BOILER OIL WILL DO THE WORK NO MATTER WHAT KIND OF WATER IS USED. LUNKENHEIMER'S "STANDARD" BOILER OIL INJECTOR has but one connection to the feed pipe, is simple and strong, and will be found a perfect machine for the purpose—visibly feeding drop by drop.

Capacity .....	$\frac{1}{2}$ Pt.	1 Pt.	1 Qt.	$\frac{1}{2}$ Gal.	1 Gal.	1 $\frac{1}{2}$ Gal.	2 Gal.
Iron, Brass Trimmings.....Each	.....	.....	.....	16.50	19.50	22.50	30.00
Brass, Part Finished.....Each	7.50	10.00	13.50	.....	.....	.....	.....
Brass, All Finished.....Each	8.00	10.60	14.25	.....	.....	.....	.....
All Finished and Nickeled.....Each	8.50	11.20	15.00	.....	.....	.....	.....
Suitable for Boilers.....H. P.	10	25	75	100	150	200	250

Reservoirs above one quart are of cast iron and have lugs on body for bolting to place; smaller sizes have a brace stud and lock nut at lower end of oil chamber for same purpose.

## LUNKENHEIMER IMPROVED "PARAGON" GLASS BODY SIGHT-FEED LUBRICATOR.

**For Gas, Gasoline or Oil Engines.**



Exterior.

The improved form of gas engine lubricator shown herewith, and which we have designated by the trade name "Paragon," will be found to adequately fulfill the requirements of the service for which it has been designed. Its construction has been improved over the other forms heretofore on the market and all objectionable features have been eliminated. The construction is very compact and the general design will, we believe, appeal to users of this class of goods.



Sectional.

Size .....	Number	1 $\frac{1}{2}$	2	4	5	7	8
Outside Diameter of Glass .....	Inches	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	3	3 $\frac{1}{2}$	4 $\frac{1}{4}$
Height of Glass.....Inches	1 $\frac{1}{2}$	1 $\frac{1}{4}$	2 $\frac{3}{4}$	3	4	5	5
Capacity (Oil).....Ounces	1 $\frac{1}{2}$	2 $\frac{1}{2}$	5	10	18	33	33
Shank Pipe Thread.....Inch	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$
Finished Brass.....Each	2.00	2.80	4.00	5.40	7.00	14.00	14.00
Nickel Plated.....Each	2.40	3.25	4.60	6.25	8.20	16.40	16.40
Extra Glasses.....Each	10	12	25	35	65	1.60	1.60
Extra Cork Washers.....Per Dozen	36	40	50	60	75	1.60	1.60

## LUNKENHEIMER "BANNER" SIGHT-FEED LUBRICATOR.

FOR GAS ENGINES, AIR COMPRESSORS, ETC.

The "Banner" Sight-Feed Lubricator is designed for gas engines, air compressors and steam valve spindles of water-works engines, and will also be found suitable for various other purposes, especially on account of its simplicity and compactness. It is provided with our improved "Sight-Feed," which is easily replaced when broken.



"Banner."

Size.....	Number	0	1	2	3	4	5	6
Diameter of Oil Chamber.....	Inches	1½	1¾	2	2¼	2½	3	3½
Capacity.....	Ounces	1	1½	2½	4	5	10	18
Shank Pipe Thread.....	Inch	¾	¾	½	½	½	½	¾
Brass.....	Each	3.50	4.00	5.00	6.00	8.00	10.00	12.00
All Finished and Nickel Plated.....	Each	4.20	5.00	6.00	7.25	9.50	12.00	14.00
Extra Sight-Feed Glasses.....	Per Dozen	.60	.60	.60	.60	.60	.60	.60

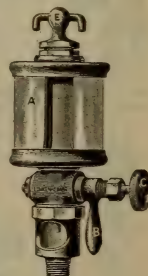
## LUNKENHEIMER

### "MARS" GAS-ENGINE LUBRICATOR.

GLASS BODY.

For Gas, Gasoline or Oil Engines, Air Compressors, Etc.

This cup is intended to supply the demand for a heavy, substantial and durable glass-body lubricator for vapor engines. The glass body enables the engineer to readily ascertain the amount of oil in the reservoir. The sight feed is large and can be easily cleaned when dirty. The feed-regulating device is so arranged that when once set it need never be changed when refilling the cup. It will feed heavy oils regularly, and having a large opening at the top is easy to fill.



Patent  
Applied For.

Size .....	Number	2	3	4	5	6
Diameter of Glass Body.....	Inches	2	2¼	2½	3	3½
Height of Glass Body.....	Inches	1½	2½	2¾	3	4
Capacity.....	Ounces	2½	4	5	10	18
Shank Pipe Thread.....	Inch	½	½	½	½	¾
Brass.....	Each	5.00	6.00	8.00	10.00	12.00
All Finished and Nickel Plated .....	Each	6.00	7.25	9.50	12.00	14.00
Extra Sight-Feed Glasses.....	Per Dozen	.60	.60	.60	.60	.60

## LUNKENHEIMER "VULCAN" FORCE-FEED SIGHT-FEED LUBRICATOR.

For Gas Engines, Air Compressors, Etc.

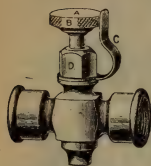
This cup will be found an excellent lubricator for feeding heavy oils when cold to gas engine and air compressor cylinders, as the spring actuated piston causes a "force feed." It has proven by tests to be a most perfect cup for the purpose intended, and is also recommended for use on bearings requiring heavy oil. Do not feed grease in this cup.



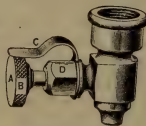
Number.....	1	2	3	4	
Outside Diameter of Cup .....	Inches	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{4}$
Capacity (Oil).....	Ounces	1 $\frac{1}{2}$	3	4 $\frac{1}{2}$	6 $\frac{1}{2}$
Shank Pipe Thread.....	Inch	$\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{2}$
Brass.....	Each	5.00	6.00	8.00	10.00
All Finished and Nickel Plated.....	Each	6.00	7.25	9.50	12.00
Extra Sight-Feed Glasses.....	Per Dozen	.60	.60	.60	.60

# LUNKENHEIMER PATENT DRIP AND SIGHT-FEED VALVES, WIPER CUPS, DRIP TROUGHS, ETC.

Oiling Devices for Engine and Machinery Bearings.



Cross Drip Valve.



Straight Drip Valve.



Angle Drip Valve.



Cross Sight-Feed Valve.



Straight Sight-Feed Valve.



Angle Sight-Feed Valve.



Cross Sight-Feed Valve with Union.



Straight Sight-Feed Valve with Union.



Angle Sight-Feed Valve with Union.



Adjustable Wiper Cup for Wick.



Adjustable Wiper Cup with Elbow Shank.



Adjustable Wiper Cup for Crank Pin.



Adjustable Plain Wiper Cup with Elbow Shank.



Plain Wiper Cup.



Horizontal Wick Wiper Cup.



Oil Cup Wiper Tip.



Drip Trough.

Herewith are shown various styles of oiling devices. They are intended to be used in connection with brass pipe and fittings, to be so adapted as to oil all of the bearing parts of an engine from one or two centrally located oil cups of large size. We can make any manner of oiling devices, but owing to the variety of conditions attending their application we would request parties when writing regarding these goods to give us, if possible, a sketch showing dimensions and style of engine for which device is required.

These fittings are neat and practical in construction, handsomely finished and convenient and economical in construction.

		Nickel
		Brass. Plated.
Cross Drip Valve .....	Each	1.50 1.75
Straight Drip Valve .....	Each	1.25 1.50
Angle Drip Valve .....	Each	1.25 1.50
Straight Sight-Feed Valve .....	Each	2.00 2.25
Straight Sight-Feed Valve w. Union, .....	Each	2.50 2.80
Angle Sight-Feed Valve .....	Each	2.00 2.25
Angle Sight-Feed Valve w. Union, .....	Each	2.50 2.80
Cross Sight-Feed Valve .....	Each	2.80 2.60
Cross Sight-Feed Valve w. Union, .....	Each	2.80 3.10
Adjustable Wiper Cup for Wick, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe .....	Each	2.50 3.00

## PLAIN WIPER CUP.

Pipe Thread.	O. Diameter.	Brass.	Nickel Plated.
$\frac{1}{4}$	$1\frac{1}{4}$	1.00	1.20
$\frac{3}{8}$	$1\frac{1}{2}$	1.50	1.75
$\frac{1}{2}$	2	2.00	2.40
...	...	...	...

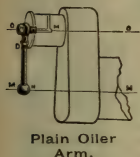
		Nickel
		Brass. Plated.
Adjustable Wiper Cup for Wick, Elbow Shank, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe ...	Each	3.00 3.50
Adjustable Crank-Pin Wiper Cup, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe .....	Each	2.50 3.00
Adjustable Plain Wiper Cup, Elbow Shank, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe .....	Each	3.00 3.50
Horizontal Wick Wiper Cup, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe .....	Each	2.00 2.30
Wiper Tips, $\frac{1}{4}$ or $\frac{3}{8}$ -inch Pipe .....	Each	.40 .50
Wiper Tips, $\frac{1}{2}$ -inch Pipe .....	Each	.50 .60

## DRIP TROUGHS.

Length.	Pipe Thread.	Rough.	Finished.	Nickel Plated
3 inches	$\frac{1}{4}$	.75	1.00	1.25
5 inches	$\frac{3}{8}$	1.00	1.50	2.00
7 inches	$\frac{1}{2}$	1.50	2.00	2.75
9 inches	$\frac{3}{4}$	2.00	2.75	3.50



## LUNKENHEIMER ADJUSTABLE CENTRIFUGAL CRANK- PIN OILING DEVICES.



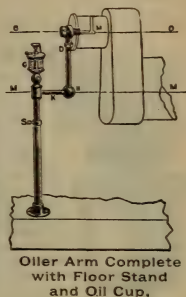
These devices furnish means for efficiently lubricating the crank-pin bearings of engines and are in no way to be compared in quality with the flimsy devices made of thin tubing and light castings as commonly placed on the market. Lunkenheim Centrifugal Oilers are substantially constructed of the very best materials, neat and graceful in design and with proper care will last as long as the engine to which they are attached. They are very economical in the use of oil, and in the case of the complete oiler the oil can be delivered continuously in any desired quantity to the crank-pin bearing without stoppage of engine. When ordering these oilers always be particular to give the necessary dimensions of engine as detailed below.

The plain oiler arm is intended to be used as an auxiliary to the crank-pin cup to afford an extra and direct means of lubricating the crank pin while the engine is in motion, by squirting oil with an oil can through the hole in ball H. In ordering these give stroke of engine.

The complete device with adjustable oil cup stand gives direct continuous lubrication to the crank pin from the oil cup on the floor stand. In ordering these give stroke of engine and distance from center of crank shaft to floor.

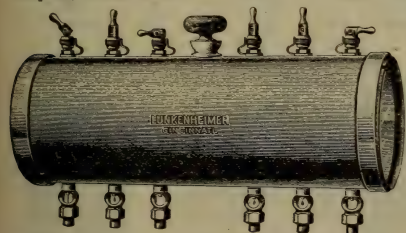
When so desired the complete device can be used for feeding grease instead of oil. In such cases we can furnish, without extra charge, a "Marine" Grease Cup in place of the oil cup which is usually provided on the floor stand. In ordering this device always state which style is desired, and when not otherwise specified we will send an oil cup of a size proportionate to that of the oiler arm.

**DIRECTIONS FOR APPLYING.**—Drill a hole lengthwise in crank pin and tap same to accommodate the shank of oiler bolt O, which is  $\frac{3}{8}$ -inch pipe thread on Nos. 1 and 2, and  $\frac{1}{2}$ -inch pipe thread on No. 3 size, unless otherwise specified. Drill a smaller hole (M) to connect to bearing; adjust the tubing at D to allow the ball H to revolve in line with the axis of the shaft M, then screw bolt O down tightly to keep oiler arm in position. To attach oiler stand, fasten floor plate and adjust oil stand, previously inserting connecting tube K in the hole of ball H.



Number.....	
Length of Stroke.....	
Thread on Bolt O.....	Pipe Thread
Plain Oiler Arm, Brass.....	Each
Plain Oiler Arm, Nickel Plated.....	Each
Complete, Brass.....	Each
Complete, Nickel Plated.....	Each

1	2	3
Up to 16 Inches	Up to 30 Inches	Up to 60 Inches
$\frac{3}{8}$ inch	$\frac{3}{8}$ inch	$\frac{1}{2}$ inch
6.00	7.00	9.00
7.00	8.00	11.00
15.00	17.00	21.00
18.00	20.50	25.00



The length of oiler arm is always half the length of stroke of engine, and the above prices on the complete device are based on furnishing a stand of ordinary height, but where specifications call for stands higher than 24 inches on the No. 1 device, 36 inches on the No. 2, and 40 inches on the No. 3, we will have to make an additional charge covering the extra height.

## LUNKENHEIMER MULTIPLE OILER.

Capacity.....	1 Pt.	1 Qt.	$\frac{1}{2}$ Gal.	1 Gal.	2 Gal.	3 Gal.
Reservoirs, Finished Brass.....	Each 8.40	11.60	15.00	20.00	26.60	36.60
Reservoirs, Nickel Plated.....	Each 9.70	13.70	17.30	22.60	29.70	40.00
Sight Feeds, Finished Brass.....	Each 1.35	1.40	1.50	1.55	1.60	1.70
Sight Feeds, Nickel Plated.....	Each 1.55	1.60	1.70	1.75	1.80	1.90
Brackets for Supporting Reservoir, Finished } Brass.....	Per Pair 1.35	1.70	2.00	2.35	2.70	3.30
Brackets for Supporting Reservoir, Nickel } Plated.....	Per Pair 1.50	1.90	2.35	2.70	3.15	4.00

## LUNKENHEIMER "IDEAL" AUTOMATIC GREASE CUP.

For Engine Crank Pins, Journals, Etc.



Exterior.

The "Ideal" is a first-class cast-brass highly-finished automatic compression cup, suitable for engine bearings, journals, etc. It is provided with a leather-packed plunger (insuring a tight joint and smooth working), which is so constructed that it is easily raised when cup requires recharging with grease. The spring and plunger are conveniently controlled by thumb-nut A, which is provided with an automatic lock arrangement to prevent its jarring from position on stem. The hole through the shank can be regulated to suit the grease used, by means of regulating screw H. As a high grade cup of superior design and perfect regulation of feed, the "Ideal" has no equal.

Number.....	00	0	1	2	3	4
Inside Diameter.....Inches	1	1 1/4	1 1/2	2	2 1/2	3
Shank Pipe Thread.....Inch	1/8	1/4	3/8	1/2	5/8	3/4
Capacity (Grease), Ounces	1/2	1	1 1/2	3	6	10
Finished Brass.....Each	1.60	2.00	2.50	3.20	4.30	6.00
Nickel Plated.....Each	1.75	2.25	2.80	3.60	5.00	6.75



Sectional.

## LUNKENHEIMER "APOLLO" COMPRESSION IRON GREASE CUP.

FOR BEARINGS, SHAFTING, ETC.



Exterior.

The "Apollo" Compression Iron Grease Cup is heavy and designed for use in all places where the finish of the article used is not important. It works well on shafting, pulleys and all bearings, and will feed from any direction. The threaded shank consists of a common pipe nipple inserted in base of cup, which can be easily replaced if broken.

Number.....	1	2	3	4
Inside Diameter.....Inches	1 1/4	2	2 1/2	3
Shank Pipe Thread.....Inch	1/4	3/4	1/2	3/4
Capacity (Grease).....Ounces	1 1/2	3	6	10
Iron.....Each	1.50	1.70	2.30	3.20



Sectional.

## LUNKENHEIMER SCREW-FEED "MARINE" GREASE CUP.



Exterior.

This cup is more particularly designed for marine engines, but will also be found suitable for many other purposes where a screw feed is desired, or it is necessary to force the grease some distance to the parts to be lubricated.

The body of this cup is made very heavy in order to withstand rough usage, and we can guarantee it to be a thoroughly substantial article in every way.

Number.....	00	0	1	2	3	4
Inside Diameter.....Inches	1	1 1/4	1 1/2	2	2 1/2	3
Shank Pipe Thread.....Inch	1/8	1/4	3/8	1/2	5/8	3/4
Capacity (Grease).....Ounces	1/2	1	1 1/2	3	6	10
Finished Brass.....Each	1.00	1.20	1.60	2.00	2.80	4.00
Nickel Plated.....Each	1.20	1.45	1.90	2.40	3.40	4.75



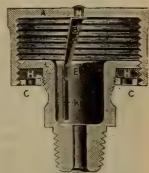
Sectional.

## Lunkenheimer "TIGER" PLAIN BRASS GREASE CUP.



The Lunkenheimer "Tiger" Plain Grease Cup is a cast-brass cup, well adapted for jarring machinery and unsurpassed where a simple, compact and efficient plain cup is required. By screwing down cap (A) the lubricant is forced to the bearing. The leather washer (H) prevents the grease from leaking out of cup and can be easily replaced when worn out; spring lock arrangement (B), the projection (E) of which engages (K) at each turn, prevents the cap from jarring off, also cuts and loosens the grease.

Always keep leather washer (H) well expanded against the thread in cap by screwing up plate (C). This plate can easily be tightened or unscrewed by using a pointed tool, inserting it in one of the holes in plate and striking it with a hammer.



Sectional.

Number .....	000	0	1	2	3	4
Inside Diameter.....Inches	1	1 1/4	1 1/2	2	2 1/4	3
Shank Pipe Thread.....Inch	1/8	1/4	1/2	3/4	1	1 1/2
Capacity (Grease).....Ounces	1/2	3/4	1	2	3 1/2	5
Finished Brass.....Each	.70	.90	1.15	1.50	2.15	2.90
Finished Brass Nickel Plated.....Each	.82	1.06	1.36	1.80	2.60	3.40
Rough Brass.....Each	.56	.74	.96	1.28	1.76	2.30

## LUNKENHEIMER "PIONEER" SLIDE-TOP GLASS OIL CUP.

The "Pioneer" Oil Cup has become an "acknowledged standard," being by far the best designed and constructed, and consequently the most perfect oiler of its class, and is adapted for all engine and machinery bearings where it is desirable to use a first-class cup. It is made of cast brass (not spun brass), is highly finished, compact and very ornamental. This and the other styles of glass oil cups manufactured by us, are the only ones on the market which will not come apart when placed on jarring machinery, neither will the feed unset or slide loosen, thereby spilling the oil. These excellent features being exclusive with our cups and covered by patents give them a very considerable prestige over all other makes. They are easily filled and regulated, and are satisfactory to users in every respect. They are especially adapted for traction engines, steam rollers and other machinery of like character where it is necessary to use a durable and substantial oiler.



Number .....	000	00	0	1	1 1/2	2	3	4	5	6
Outside Diameter of Glass.....Inches	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3	3 1/2	4
Height of Glass.....Inches	2 1/2	1	1 1/4	1 3/4	1 1/2	1 3/4	2 1/4	2 3/4	3	4
Capacity.....Ounces	1/2	3/4	1	1 1/2	2	2 1/4	3	4	5	6
Shank Pipe Thread.....Inch	1/8	1/4	1/2	3/4	1	1 1/2	2	2 1/4	3	4
Finished Brass.....Each	.70	.75	.80	1.00	1.25	1.50	1.90	2.40	3.10	4.00
Nickel Plated.....Each	.80	.85	.95	1.20	1.50	1.75	2.20	2.75	3.50	4.50

## LUNKENHEIMER VICTOR "INDEX" GLASS OIL CUP.



The Lunkenheimer "Victor" Index Glass Oil Cup is provided with a simple "index" device for regulating the feed of oil and has an indicator arm pivoted on the stem and turning on the lid to mark the notch giving the desired rate of feed. The feed can be instantly turned off and on again by replacing the lever in the notch of the indicator arm. When index arm is closed the lever can be left to stand up out of notch, thus acting as an indicator to show from a distance that feed is shut off. This cup is exactly like the "Crown," but without sight feed.

Number .....	0	1	1 1/2	2	3	4	5	6
Outside Diameter of Glass.....Inches	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3	3 1/2
Height of Glass.....Inches	1 1/2	1 3/4	1 1/2	1 3/4	2 1/4	2 3/4	3	4
Capacity.....Ounces	3/4	1	1 1/2	2 1/4	3	4	5	6
Shank Pipe Thread.....Inch	1/8	1/4	1/2	3/4	1	1 1/2	2	2 1/4
Finished Brass.....Each	1.00	1.20	1.45	1.75	2.15	2.70	3.40	4.30
Nickel Plated.....Each	1.15	1.40	1.70	2.00	2.45	3.05	3.80	4.80



## LUNKENHEIMER "SENTINEL" SNAP LEVER SIGHT-FEED GLASS OIL CUP.

UNEQUALED  
FOR DYNAMO AND ENGINE USE.



Lever up,  
cup feeding.

The Lunkenheim "Sentinel" Snap Lever Sight-Feed Glass Oil Cup, as will be seen, is handsome and ornamental in appearance and thoroughly strong and substantial in construction. It is simple in operation, compact, well made and not liable to get out of order. Owing to its construction the cup will not shake to pieces when placed on jarring machinery; neither will the feed unset when either raising or lowering lever, as the curved spring which presses against the milled regulating nut prevents it from turning.

Number.....	0	1	1½	2	3	4	5	6
Out. Diam. Glass, Inches	1¼	1½	1¾	2	2¼	2½	3	3½
Height of Glass, Inches	1½	1¾	1¾	1¾	2½	2½	3	4
Capacity.....Ounces	¾	1	1½	2½	4	5	10	18
Shank Pipe Thread, Inch	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....Each	3.00	3.25	3.50	3.75	4.25	5.25	7.25	9.25
Nickel Plated.....Each	3.50	3.75	4.00	4.25	4.75	5.75	8.00	10.25



Lever down,  
feed stopped.

## LUNKENHEIMER "CROWN" INDEX SIGHT-FEED GLASS OIL CUP.

The Lunkenheim "Crown" Index Sight-Feed Glass Oil Cup is of first-class quality throughout, very ornamental in appearance and made of cast brass. It has an "index" device for regulating the feed of oil and an indicator arm turning on the lid to mark the notch giving the desired feed. The feed can be instantly turned off and on again by replacing the index lever in the notch of the indicator arm. When the feed is shut off the lever can be left to stand up out of the notch, thus acting as an indicator to show from a distance that the feed is shut off. It fulfills all the requirements for dynamo and engine use and we recommend it where a first-class substantial cup is wanted.

Number.....	0	1	1½	2	3	4	5	6
Outside Diam. of Glass, Inches	1¼	1½	1¾	2	2¼	2½	3	3½
Height of Glass.....Inches	1¼	1¾	1¾	1¾	2½	2½	3	4
Capacity.....Ounces	¾	1	1½	2½	4	5	10	18
Shank Pipe Thread.....Inch	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....Each	1.25	1.50	1.75	2.10	2.55	3.15	3.90	4.80
Nickel Plated.....Each	1.40	1.70	2.00	2.35	2.85	3.50	4.30	5.30



## LUNKENHEIMER "ROYAL" SIGHT-FEED GLASS OIL CUP.

The Lunkenheim "Royal" Sight-Feed Glass Oil Cup will be found an excellent cup for engine and dynamo use. It is simple and practical, and so constructed that when the desired feed is once set it can be stopped and started at will without resetting, the spring acting as a lock and indicator when engaging the flattened side of the thumb nut.

Number.....	000	00	0	1	1½	2	3	4	5	6
Height of Glass.....Inches	¾	1	1½	1¾	1¾	1¾	2½	2½	3	4
Capacity.....Ounces	¼	½	¾	1	1½	2½	4	5	10	18
Shank Pipe Thread.....Inch	¾	¾	¾	¾	¾	¾	¾	¾	¾	¾
Finished Brass.....Each	.95	1.10	1.25	1.50	1.75	2.10	2.55	3.15	3.90	4.80
Nickel Plated.....Each	1.05	1.20	1.40	1.70	2.00	2.35	2.85	3.50	4.30	5.30



# LUNKENHEIMER "CHAMPION" ROD OIL CUP.

SUITABLE FOR ALL MOVABLE BEARINGS.



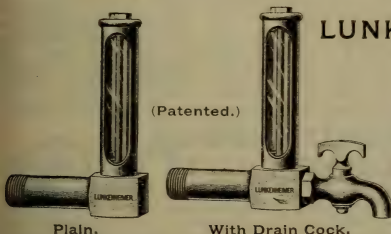
The construction of this cup is simple, the round body having a window on each side of same to enable the engineer to see the height of oil in cup. The feeding arrangement consists of tubes, one telescoping within the other, the outer tube fastened permanently in the base of the cup and communicating with the oil hole in the shank of same. The inner tube is fastened to the filling plug, and has small oil holes drilled in it close to the top and carries a regulating nut on the upper threaded portion, said nut being adapted to partially close the oil holes for the purpose of regulating (when the cup is in operation) the quantity of oil to be fed through same. A feature in having the oil tubes telescope is that, when filling the cup, it is not necessary to entirely remove the filling plug, but simply to raise it high enough to insert the nozzle of the oil can, which prevents losing plugs. The oil ducts are large and straight and it is easy to keep the cup clean and free from impurities which may be in the oil.

The operation of this cup will be readily understood when reference is made to the illustration. The cup having been filled with oil, as soon as it is put in motion the oil begins to travel in a body within the cup, and at each revolution of cup is thrown against the feeding apparatus and flows down through it to the bearing. Thus it will be obvious that no matter how little oil there may be in the cup, the centrifugal force, combined with the shape of the body, will carry it to the holes in the feed tube.

Care should be taken in attaching the cup so that the circular body of same is placed that it travels in the same direction as the bearing and the glass sides are parallel with the rod. After the cup is once regulated it requires no further

attention other than filling. This cup will not throw oil and feeds only while machinery is in motion. It is well made of cast brass, neat in appearance, and broken glass can be easily renewed at slight expense.

Number.....	1	2	3	4
Finished Brass..... Each	1.40	2.00	2.60	4.00
Nickel Plated..... Each	1.50	2.20	2.80	4.40
Capacity..... Ounces	1½	2½	5	12
Shank Pipe Thread..... Inch	¼	¾	½	¾
Glasses..... Each	.05	.08	.10	.15
Corks..... Per Dozen	.20	.30	.40	.60



## LUNKENHEIMER OIL GAUGES.

WITH REVOLUBLE SHIELD.

The oil gauges heretofore used on dyamos and other machinery having self-oiling journal boxes, possess several serious objections, which have been entirely overcome in the Lunkenheimer Improved Gauge, and on account of its advantages and low price is rapidly superseding them. All users of oil gauges are aware that with those heretofore used it is impossible to clean the glass tube, which soon becomes so covered with dust and dirt collecting in the slots of the shield that the oil can not be seen. Besides, the slots or windows of the gauge are not always in proper position as regards the light to enable one to see the oil, and the shield being fixed can not be turned to suit.

Then, owing to the construction of these oil gauges they are unnecessarily clumsy and expensive. The Lunkenheimer Oil Gauge will be found perfect in all these particulars: it is simple and practical in construction, can be easily taken apart, is handsome in appearance and inexpensive. The glass protecting shield is a slotted tube, which permits being revolved around the glass tube; thus it can easily be kept clean and the shield set in proper position as regards the light, so that the oil is plainly visible. The entire gauge is held together by a thin wire rod, which is screwed into the bottom fitting, passes through the center of glass tube and has a nut fastened to it on the upper side of top cover. To clean the glass tube, hold a piece of waste to the tube, and revolve it with the shield around the glass until properly cleaned, then turn the shield to its former position.

Size Shank Pipe Thread.....	Inch	¾	¾	¾	¾
Length of Glass.....	Inches	2	2½	3	4
Finished Brass without Drain Cock..... Each		.40	.50	.65	1.00
Nickel Plated without Drain Cock..... Each		.55	.65	.80	1.20
Finished Brass with Drain Cock..... Each		.80	.90	1.05	1.40
Nickel Plated with Drain Cock..... Each		1.00	1.10	1.25	1.65

## LUNKENHEIMER SHAFT OILERS.

**DIRECTIONS FOR USING LUNKENHEIMER SHAFT OILERS.**—Fill the oiler (full) with oil, screw on the socket airtight, then screw the stem tightly into the oilhole in bearing. When the cup needs refilling unscrew the stem out of the hole, take the oiler apart, and proceed as before. See that the hole through stem is always clear of any obstruction before putting the oiler in its place.

*See that the glass globe is always tight in its socket.*

**TO REGULATE.**—The oilers are shipped set for a MODERATE feed. The oil-hole in the stem is drilled parallel with the slot in head of the set-screw. By turning the regulating screw a QUARTER-TURN BACKWARD the supply of oil is entirely cut off. Between these two positions of the screw any desired amount of feed may be had.

Shanks are threaded  $\frac{3}{8}$  inch on point, 16 threads to the inch.



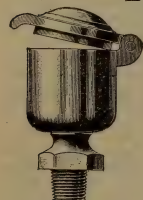
Shaft Oiler.



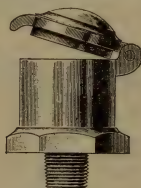
Shaft Oiler with Loose Wire and Wood Plug.

Number.....	1	2	3
Capacity.....	Ounces 1	1½	2½
Finished Brass.....	Each .50	.55	.60
Extra Glasses.....	Each .08	.08	.08
Extra Cork Washers.....	Per Dozen .15	.15	.15

## LUNKENHEIMER BRASS OIL CUPS.



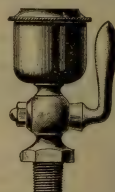
Small Base, Hinge Lid.



Large Base, Hinge Lid.



Plain.



With L. H. Cock.



Locomotive Pattern.

Number.....	00	0	1	2	3	4	5	6	7	8	9
Outside Diameter.....	Inches ¾	¾	¾	1	1 ¼	1 ½	1 ¾	2	2 ¼	2 ½	2 ¾
Shank Pipe Thread.....	Each ½	½	¾	¾	¾	¾	¾	¾	¾	¾	¾
Plain Finished Brass.....	Each .25	.30	.35	.40	.50	.60	.75	1.00	1.25	1.50	1.75
Locomotive Pattern, Finished Brass.....	Each .30	.35	.40	.50	.75	1.00	1.50	2.00	2.50	3.00	3.50
Finished Brass with T. H. Cock.....	Each .80	.90	1.00	1.50	2.00	2.50	3.00	3.25	4.00	5.00	5.00
Finished Brass with L. H. Cock.....	Each .90	1.00	1.10	1.60	2.20	2.75	3.00	3.25	4.00	5.00	5.00
Finished Brass.....	Each .70	.85	1.20	1.60	2.10	2.50	2.70	3.00	3.25	4.00	5.00
Finished Brass with Elbow Shank.....	Each .85	1.15	1.60	2.10	2.65	3.05	3.25	3.50	4.00	5.00	5.00
Add to List for Brass Tubes.....	Each .10	.10	.10	.10	.15	.15	.15	.15	.20	.20	.20
Add to List for Nickel Plating.....	Each .10	.10	.10	.10	.10	.15	.15	.15	.20	.20	.20



## LUNKENHEIMER BRASS LOOSE PULLEY OILER.

This oiler must be attached to hub of pulley, is easily filled and regulated, will not throw or waste oil, and a trial will convince users that it is a simple and satisfactory oiler for loose pulleys. It is guaranteed to give satisfaction, one filling lasting from two to four weeks and feeding only when pulley is in motion.

Number.....	0	1	2	3	4
Diameter of Body.....	Inches 1 ¼	1 ½	1 ¾	2	2 ¼
Capacity.....	Ounces ¼	½	¾	1 ¼	1 ¾
Rough Brass, Bronzed, Each.....	.25	.30	.40	.50	.65

## Lunkenheimer CYLINDRICAL GLASSES.

These glasses are clear, strong and uniform in size and interchangeable with all styles of glass cups made by us.

Number.....	000	00	0	1	1 ½	2	3	4	5	6	8
Outside Diameter of Cylindrical Glasses, Each.....	¾	1	1 ¼	1 ½	1 ¾	2	2 ¼	2 ½	3	3 ½	4 ¼
Height Cylin. Glasses, Inches.....	¾	1	1 ½	1 ¾	1 ¾	2	2 ½	2 ¾	3	4	5
Cylindrical Glasses... Each.....	.05	.06	.08	.10	.10	.12	.15	.25	.35	.65	1.50
Cork Washers... Per Dozen.....	.15	.18	.24	.30	.36	.40	.45	.50	.60	.75	1.50



# POWELL'S IMPROVED Crank Pin Oilers,

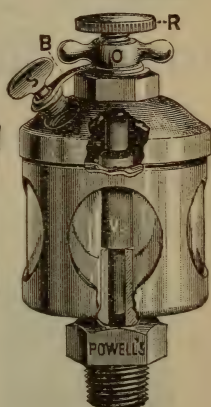
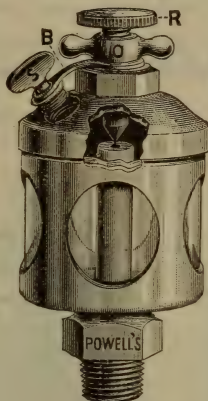
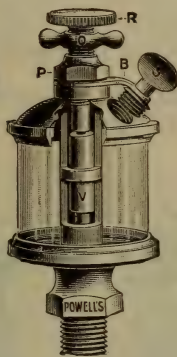
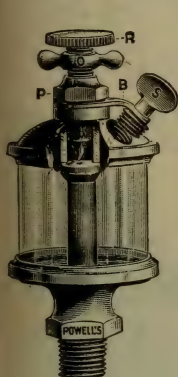
PLAIN.

WITH SHIELDS.

"PINNACLE." "PLANET."

"POLARIS."

"PAROLE."



POWELL'S

## Glass Cylinder Oil Pump.

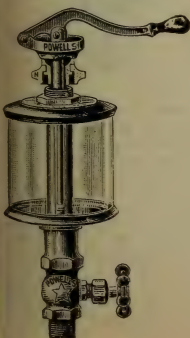
### PRICE LIST.

Number .....	0	1	1½	2	3	4
Outside Diameter of Glass..Inches	1¼	1½	1¾	2	2¼	2½
Height of Glass.. .."	1⅞	1¾	1⅝	1⅞	2⅞	2¾
Capacity .....	1½	1	1½	2½	4	6
Size of Shank, Pipe Thread..Inches	¼	¾	¾	¾	¾	½
Plain Glass, Finished .....	\$1 35	\$1 60	\$1 80	\$2 30	\$2 75	\$3 75
" Nickel plated .....	1 75	2 05	2 30	2 80	3 35	4 45
With Shield, Finished .....	1 50	1 75	2 00	2 50	3 00	4 00
" Nickel Plated ..	1 90	2 20	2 50	3 00	3 60	4 70

"PENNANT."

### PRICE LIST.

Number.	Outside Diam. Glass Cylinder.	Height of Glass Cylinder.	Capacity.	Shank Pipe Thread.	Brass. Each.	Nickel Plated. Each.	Extra Glass. Each.
1	2¼ inch.	2½ inch.	½ pt.	¾ inch	\$ 7 50	\$ 8 00	\$0 15
1½	3 " "	2¾ " "	½ " "	¾ " "	8 50	9 50	35
2	3½ " "	4 " "	1 " "	½ " "	10 00	11 00	65
3	4½ " "	5 " "	1 qt.	½ " "	15 00	16 50	1 50





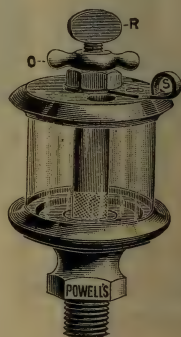
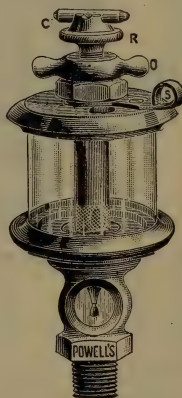
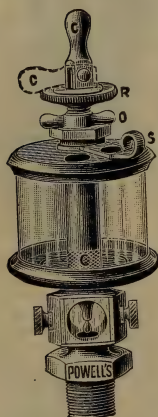
# Powell's Patent Improved Glass Oilers.

"SIGNAL" OILER.

"PILOT"

"PILGRIM"

Cross-Bar Sight Feed Oiler. Improved Glass Engine Oiler



## PRICE LIST.

Number.....	00	0	1	1½	2	3	4	5	6
Outside Diameter of Glass....Inches	1 ⅞	1¼ 1⅞	1½ 1⅞	1¾ 1⅞	2 1⅞	2¼ 2⅞	2½ 2⅞	3 2¾	3½ 4
Height of Glass..... "									
Capacity.....		½ oz	¾ oz	1 oz	2 oz	¼ pt.	⅓ pt.	½ pt.	1 pt.
Size of Shank, Pipe Thread...Inches	1/8	¼	¼	¾	¾	¾	¾	¾	¾
"Signal" Oiler ..... Finished	\$3 00	\$3 25	\$3 50	\$3 75	\$4 25	\$5 25	\$7 25	\$9 25	\$9 25
"Signal" Oiler ..... Plated	3 50	3 75	4 00	4 25	4 75	5 75	8 00	10 25	10 25
"Pilot" Cross-Bar Sight ..... Finished	\$1 30	1 40	1 50	1 75	2 00	2 25	2 65	3 35	4 50
"Pilot" Cross-Bar Sight ..... Plated	1 55	1 65	1 75	2 10	2 35	2 65	3 10	3 85	5 10
"Pilgrim" Plain Glass ..... Finished	75	80	1 00	1 25	1 50	1 90	2 40	3 10	4 00
"Pilgrim" Plain Glass ..... Plated	85	95	1 20	1 50	1 75	2 20	2 75	3 50	4 50



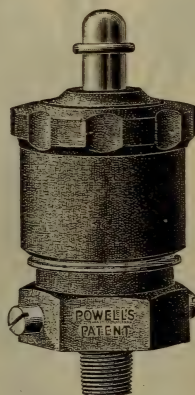
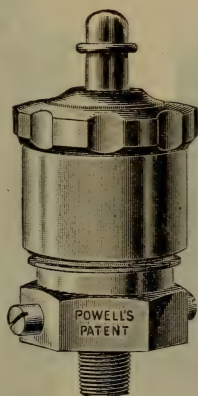
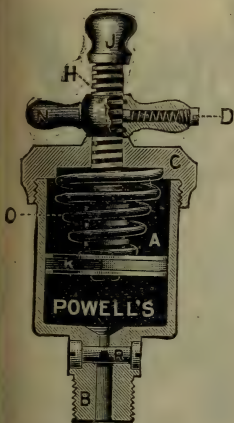
# POWELL'S IMPROVED Compression Grease Cups,

Class "C," for Slides, Eccentrics and other Bearings of Engines.

Class "B" makes a first-class Crank Pin Grease Cup,

Simple, Easily Operated and Reliable.

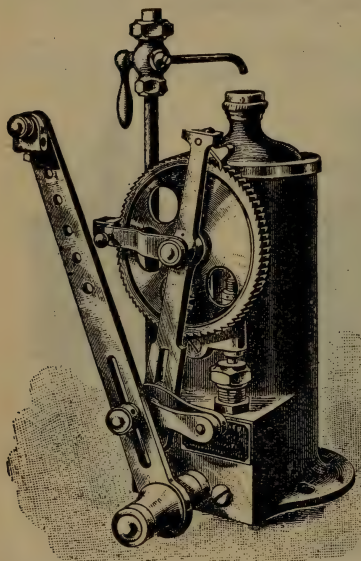
BRASS, CLASS "B." BRASS, CLASS "C." ALL IRON, "BRUNO."



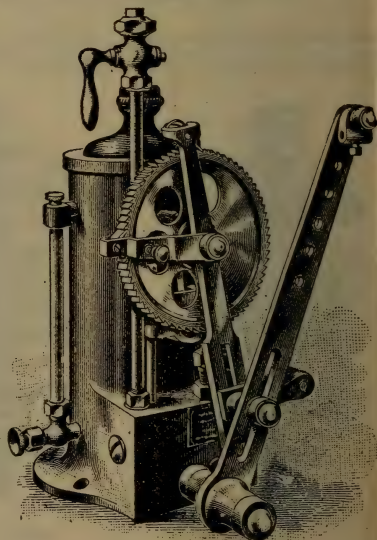
Number .....	00	0	1	2	3	4	5
Inside Diam. of Body.....Inch	1	1¼	1½	2	2½	3	3½
Capacity.....	½ oz.	1 oz.	1½ oz.	3 oz.	6 oz.	10 oz.	1 pt.
Size Shank, Pipe Thread..Inch	⅝	¾	⅞	¾	½	½	½
Class "B," Finished....Per Doz.	\$18 00	\$21 00	\$30 00	\$38 40	\$51 60	\$72 00	\$120 00
" " Plated..... "	21 00	27 00	33 60	43 20	60 00	81 00	144 00
Class "C," Finished.... "	21 00	25 00	29 00	33 50	50 00	.....	.....
" " Plated..... "	24 00	28 00	32 00	37 00	54 00	.....	.....
All Iron, "Bruno,"..... "	10 00	11 25	12 00	12 50	25 00	.....	.....

## Single Feed Lubricator.

Including Valves, Connecting Rod, one 6 ft. length N. P  
Pipe, Arm and Stand complete ready to attach to Engine.



Pat. Aug. 7, 1894. July 21, 1896. Sept. 21, 1897.  
Other patents pending.



Pat. Aug. 7, 1894. July 21, 1896. Sept. 21, 1897.  
Other patents pending.

One Pint,	-	-	-	-	\$30.00 Each.
Three Pints,	-	-	-	-	35.00 "
One Gallon,	-	-	-	-	45.00 "
Two Gallons,	-	-	-	-	50.00 "

# Brass Steam Whistles.

POWELL'S

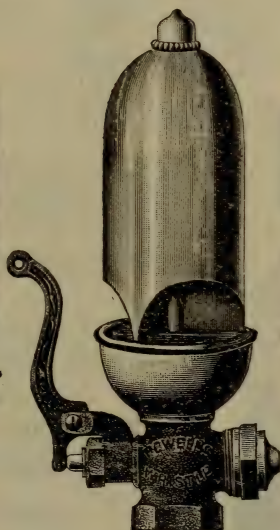
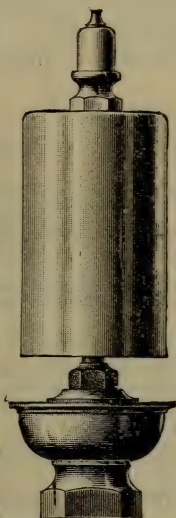
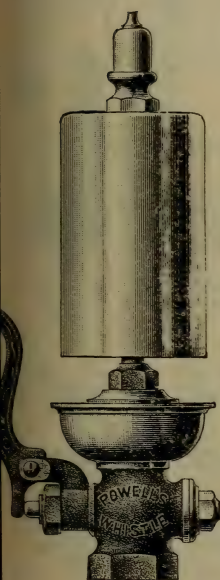
Adjustable  
Lever.

Without  
Lever.

Single Bell Chime Whistle.

With Adjustable  
Lever.

Without  
Valve.



## PRICE LIST.

Diameter of Bell.....Inches Size Pipe Connection.. "	1 ¼	1¼ ⅜	1½ ½	2 ¾	2½ ¾	3 1	3½ 1	4 1¼	5 1½	6 2	8 2½
Adjustable Lever.....	\$3 10	\$3 75	\$4 00	\$5 50	\$6 50	\$8 50	\$11 50	\$15 00	\$22 50	\$33 00	\$95 00
Without Lever .....	2 20	2 75	3 00	4 35	5 25	7 25	9 50	12 00	19 00	24 00	70 00
Single Bell Chime, Adjustable Lever ..	6 00	6 00	7 00	9 10	11 00	15 00	18 00	25 00	35 00	45 00	100 00
" " " Without " ..	4 50	5 00	7 00	8 00	11 00	14 00	28 00	38 00	85 00		

## LUNKENHEIMER IMPROVED COMBINATION OR FIRE ALARM WHISTLE.

(PATENTED.)



Complete with Valve.

This whistle is designed to answer both the purposes of an ordinary whistle as well as that of a fire alarm. It is provided with a piston that can be moved up or down within the bell or tube, thus changing the interior length of same and, consequently, also the sound of the whistle. When the piston is not operated the whistle gives but one sound, like any ordinary whistle, but when pulled up and down, a howling, penetrating noise is produced. When placed above the roof of a building, an extension rod should be coupled to the piston stem and a rope or wire to the whistle valve lever. The bell is dome shaped at its upper end and at its lower securely supported by a three-armed spider, the stem of which is adjustably screwed into the whistle base and fastened by jam nut E. Owing to this construction the lower edge of the bell is always exactly in line with the slot in the base through which the steam escapes, thereby insuring best results and a perfect, clear and loud tone. The bell is raised or lowered to suit steam pressure by screwing it up or down, and when properly set is fastened by jam nut E. All whistles are made of best materials and fully warranted.

Diameter of Bells.....Inches	2½	3½	5	8
Size Pipe Connection.....Inches	¾	1	1½	2
With Whistle Valve complete....Each	24.00	31.00	40.00	100.00



All Brass, with Adjustable Lever.

## LUNKENHEIMER SINGLE BELL CHIME WHISTLES.

The Single Bell Chime Whistles shown herewith differ essentially from other makes, inasmuch as the bells are cast in one piece instead of being made in several parts. Owing to this method of construction these whistles (when blown) give clear, bell-like, musical sounds, which are much more pleasing to the ear than those produced by common whistles.

The appearance of these whistles is unique and handsome, they are well made, perfectly tuned, and for durability of construction are unequaled.

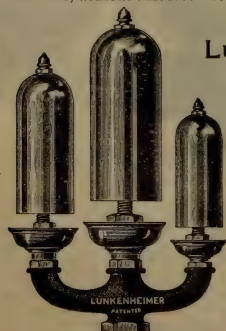


All Brass, without Valve.

Diameter of Bells.....Inches	1½	2	2½	3	3½	4	5	6	8	10
Size of Pipe Connections.....Inches	¾	½	¾	1	1	1¼	1½	1½	2	2½
All Brass, with Adjustable Lever.....Each	7.00	10.00	13.00	16.00	22.00	28.00	44.00	60.00	145.00	235.00
All Brass, without Valve.....Each	5.50	8.50	10.50	13.50	18.50	24.00	37.00	49.00	120.00	188.00
Iron Base, without Valve.....Each	.....	.....	.....	12.00	16.50	22.00	33.00	45.00	108.00	155.00

## Lunkenheimer THREE-WHISTLE CHIME. IMPROVED AND RECONSTRUCTED.

THREE-WHISTLE CHIMES CORRECTLY TUNED.



Three-Whistle Chime.

No. 1. Composed of one each 1½, 2 and 2½-inch Whistles.....	22.00
Size Pipe Connection, 1-inch.	
No. 2. Composed of one each 3½, 4 and 5-inch Whistles.....	40.00
Size Pipe Connection, 1½-inch.	
No. 3. Composed of one each 5, 6 and 8-inch Whistles.....	100.00
Size Pipe Connection, 3-inch.	

NOTICE.—Whistle Valves for above are extra, and Chimes will be sent complete with valve unless otherwise ordered.





## Lunkenheimer BRASS STEAM WHISTLES and WHISTLE VALVES.

Diameter of Bells.....Inches	1	1 1/4	1 1/2	2	2 1/4	3	3 1/2	4	5	6	8	10
Size of Pipe Connections, Inches	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/2	4	5
Brass Whistles, with Adjustable Lever .....	Each	3.10	3.75	4.00	5.50	6.50	8.50	11.50	15.00	22.50	33.00	160.00
Brass Whistles, without Valve, Each		2.20	2.75	3.00	4.35	5.25	7.25	9.50	12.00	19.00	24.00	133.00
Iron Base Whistles, without Valve, Each						5.50	7.25	10.00	16.00	23.00	55.00	100.00

### WHISTLE VALVES.

WHISTLE VALVES.										
Size .....	Inches	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3
Brass.....Each		2.00	2.50	3.00	3.50	5.00	6.00	9.00	18.00	27.00

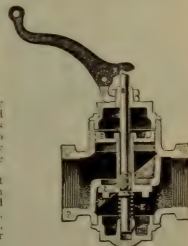
## Lunkenheimer AUTOMATIC BALANCED WHISTLE VALVE.

The form of whistle valve shown herewith effectually overcomes the difficulties that steam users have experienced with the old style of valve. Under high steam pressures it is very difficult to operate the ordinary whistle valves and to keep them tight. In them the disc is not balanced, and as they close with the steam pressure the continual pounding on the seat soon causes them to become leaky and troublesome.

This valve can be operated very easily under the highest steam pressures, and can be kept tight without difficulty. In this new form of valve the disc is balanced at all times, and when the valve is closing it does not hammer on the valve seat, but closes firmly and without any shock or jar. In opening, the steam pressure acts upon the valve disc in such a manner that the disc is raised from the seat almost automatically. Guaranteed for 175 lbs. working pressure.



Exterior.

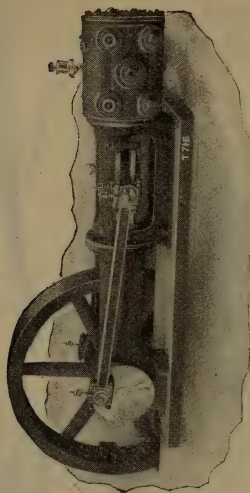
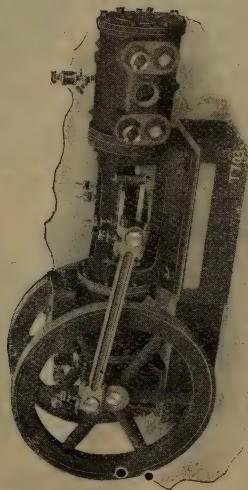


Sectional.

Size of Valve.....Inches	1	1 1/4	1 1/2	2	2 1/4	3
Screw Ends.....Each	18.00	22.20	26.60	35.50	44.40	62.20
Screw and Flange Ends.....Each	21.40	26.00	31.80	41.80	51.00	74.80
Flange Ends.....Each	22.20	27.50	33.60	43.80	53.20	77.00

Extra heavy pattern for 350 lbs. working pressure can also be furnished. Prices upon application.

## AIR COMPRESSORS.



Steam Driven Straight Line Compressors. Class BB.

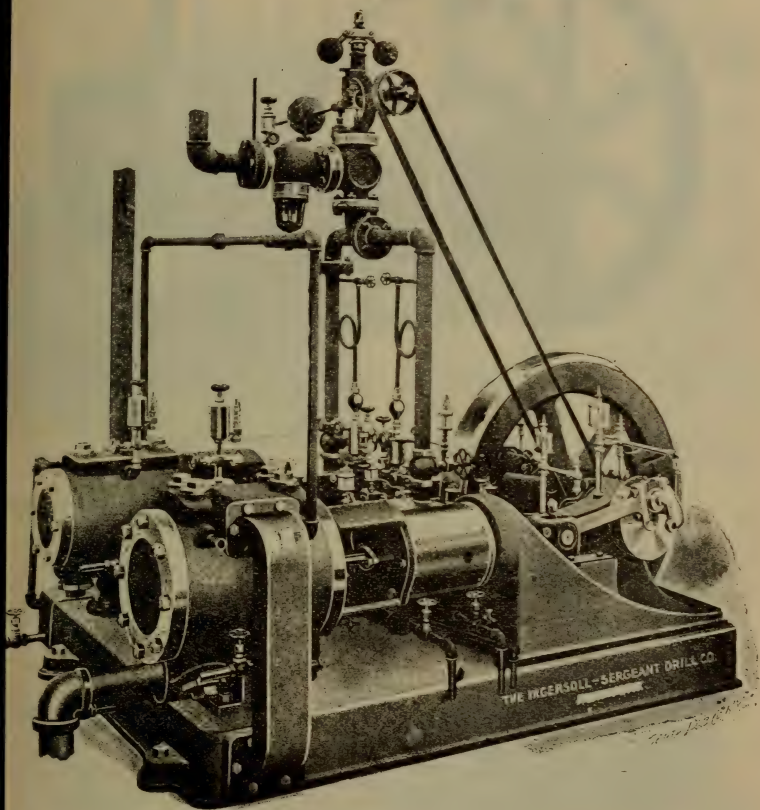
	Steam Cylinder	Air Cylinder	Stroke	Revolutions per Minute	Air Piston Displacement Cubic Feet per Minute	Boiler H. P.	Floor Space	
							Length	Width.
Steam Pressure 70 Air Pressure 80	6	6	6	150	29.5	8.5	5' 7"	2' 1"
	8	8	8	150	70.	20.	6' 9"	2' 4"
	10	10	10	150	137.	35.	8' 0"	2' 5"
	12	12	12	150	236.	60.	9' 0"	2' 9"
Steam Pres. 100 Air Pressure 60	14	14	12	150	321.	80.	9' 8"	3' 2"
	6	8	6	150	70.	18.	6' 9"	2' 4"
	8	10	8	150	137.	35.	8' 0"	2' 5"
	10	12	10	150	236.	50.	9' 0"	2' 9"
Steam Pressure 90 Air Pressure 60	12	14	12	150	321.	70.	9' 8"	3' 2"
	6	8	6	150	52.5	12.	5' 8"	2' 1"
	8	10	8	150	109.	25.	6' 10"	2' 4"
	10	12	10	150	197.	40.	8' 1"	2' 5"
Steam Pres. 125 Air Pressure 60	12	14	12	150	321.	60.	9' 1"	2' 9"
	14	16	12	150	420.	80.	9' 9"	3' 2"
	6	10	8	150	109.	20.	6' 10"	2' 4"
	8	12	10	150	197.	35.	8' 1"	2' 5"
Pressure 60	10	14	12	150	321.	55.	9' 1"	2' 9"
	12	16	12	150	420.	70.	9' 9"	3' 2"

Power Driven Straight Line Compressors. Class TB.

Air Cylinder	Stroke	Revolutions per Minute	Air Piston Displacement Cubic Feet per Minute	Air Pressure in pounds	Horse Power Required	Pulley	
						Diameter	Width Face in inches
6	6	150	29.5	80	5.5	30	5 3/4
8	8	150	70.	80	12.6	40	6 3/4
10	10	150	137.	80	24.5	50	8 3/4
12	12	150	236.	80	42.5	60	9 3/4
14	12	150	321.	80	58.	70	10 3/4
8	6	150	52.5	60	8.	30	5 3/4
10	8	150	103.	60	16.5	40	6 3/4
12	10	150	197.	60	30.	50	8 3/4
14	12	150	321.	60	48.5	60	9 3/4
16	12	150	420.	60	63.5	70	10 3/4

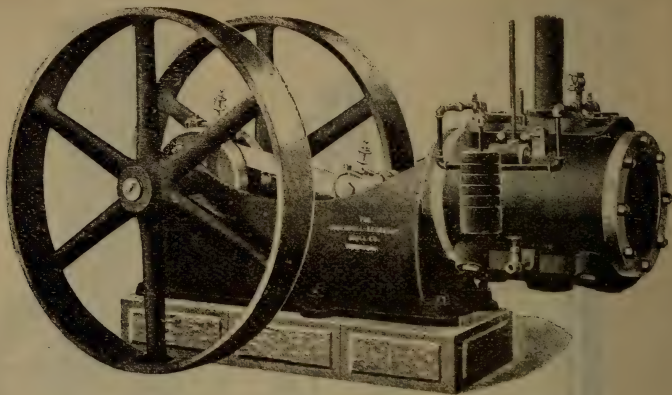
We furnish Air Compressors of numerous designs and sizes for use in railroad shops, mines, quarries, manufactories of all kinds, for pumping water by compressed air, and for all purposes for which air is used.

If the above list does not cover your requirements, write us.



INGERSOLL-SERGEANT DUPLEX STEAM DRIVEN AIR COMPRESSOR,  
CLASS "H."

With compound air cylinders and inter-cooler in base.



INGERSOLL-SERGEANT BELT DRIVEN AIR COMPRESSOR, CLASS "E."

Made in small sizes, suitable for light machine shop and foundry use, also for pumping by the air lift system.

### Description of Class "E" Belt Compressor.

While the steam driven compressor has an advantage in that it can be used independently of all other machinery, and that air pressure is always available when steam is up, the belt compressor is sometimes preferred through its lower first cost and smaller space occupied. When the main engine is of large size and of economical pattern with reserve power, the small belt machine may be more economical than if equipped with its own engine. These belt compressors are frequently run from gas engines, electric motors, water-power, etc., by gears, belting or rope transmission.

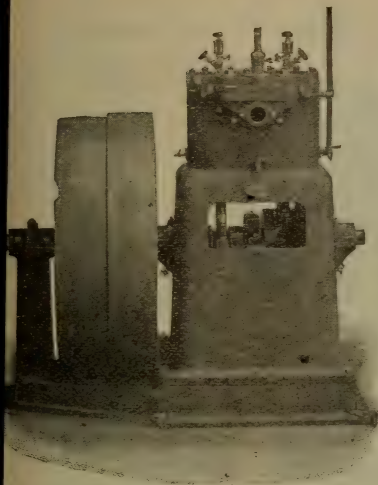
The same care and close attention given to every detail of the Class "F" compressors, is also accorded the belt machines.

The belt pulleys are of large size and of comparatively great weight, thus giving a steady belt pull and avoiding that jerky motion. For medium or light pressures, one belt only is used. For slow speed or heavy pressures, two belts are desirable and will give a central pull on the crank, without pounding or side motion. The crank pin is large and runs in phosphor bronze. The cross-head runs on a wide bronze shoe, and may be adjusted for wear, but all bearings are so large that little attention is required. The bed plate is strong and rigid, and its great stiffness and weight adds to the durability and smooth running qualities.

All compressors are supplied with drop sight feed oil cups for bearings, and large drop sight feed lubricators for cylinders. This type of machine is built in sizes varying in capacity from 10 to 250 cubic feet, and in patterns proportioned for 10 to 100 lbs. pressure. With the automatic unloading device it is an ideal machine for work within its capacity.

The special unloading device shown in above cut is not regularly supplied with these compressors, but can be furnished, if so desired and specified when order is given, at a small extra cost.





## CURTIS COMPRESSOR.

SIZE 6x6 AND 8x8

**Construction:** The cylinders are both single-acting, thus eliminating all stuffing boxes and cross-heads. Crank shaft is of open hearth steel, and runs in chain-oiling boxes.

**Water Jackets** completely surround the cylinders, cylinder heads and valve cases.

**Valves** are made of the poppet gravity type of best quality phosphor bronze, and work without springs. The valves are located in a separate case. The discharge valves have renewable seats.

**The Governor** is combined with the valve case, and will automatically maintain any desired air pressure. The governor does not stop the movement of the machine, and will instantly respond to the slightest change of pressure in reservoir.

**Lubrication** is perfect as to every detail.

**Attention:** As machine is automatic and self-oiling, practically no attention is required.

## COMPOUND BELT-DRIVEN COMPRESSOR.

For heavy duty we recommend compressor on sub-base.

**This Compressor** was designed with the intention of making it the most economical as well as the best constructed machine of its size on the market.

**The Driving Pulleys** located in the center of the machine, are 60 inches in diameter, by 10 inch face; tight pulley weighing 1000 lbs.

**Both Cylinders** are water-jacketed. The intercooler contains a large number of thin brass tubes. The air passing through the intercooler is delivered to the high pressure cylinder at the temperature of the cooling water.

**Large Cooling Surface**, due to the single acting principle.

**Absence of Piston Rods** and troublesome stuffing boxes.

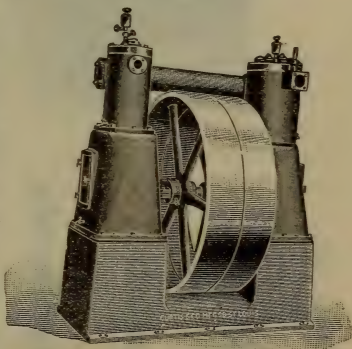
**The Valves** are easily accessible by removing plug or cap. No pipe connections or joints to be broken to get at the cylinders or valves.

**All Valve Seats** are removable; all parts self-oiling. The machine being self-contained, but slight foundations are required.

**The Intake Cylinder** has wind box connection, so that air may be carried from desirable point outside of the building.

**The Compressor** is provided with an automatic governor which unloads the machine when the pressure reaches the desired maximum in the reservoir. The fly wheel drive pulley never stops.

When driven from a line shaft actuated by Corliss or other economical engine, this machine forms the most economical compressing plant of its capacity that can be installed.



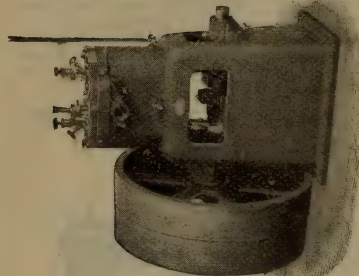
SIZES 13 AND 8x12. 16 AND 10x16.

...TABLE OF...

Curtis

Automatic

Compressors.



THIS MACHINE

HAS NO LOOSE PULLEY

EXCEPT

WHEN FURNISHED

ON SUB-BASE.

Code Word.	Actual capacity of machine in cubic feet of free air per minute at speed given.	Size of Air Cylinder.	Pressure designed for in Pounds.	Revolutions per Minute	Theoretical capacity per revolution.	Floor space, inches.	Max. height above floor.	Size of pulleys or steam cylinder in inches.	Suction Pipe.	Discharge Pipe.	Approximate Horse Power Required at Listed Capacity.				Shipping Weights.	Price.
											40 pds.	60 pds.	80 pds.	100 pds.		
															Do. For- mestic egn.	Properly packed F.O.B.

## BELT-DRIVEN, SINGLE STAGE.

Burnishing .....	25	6 x 6	50-80	140	.196	32 x 38	3'-9"	32 x 6	2	1½	3.1	3.8	4½	5.0	1,360	1,410
Burnoose .....	25	6 x 6	80-100	140	.196	32 x 47	4'-4"	32 x 6	2	1½	3.1	3.8	4.5	5.0	1,450	1,720
Burrow .....	50	Sub-Base { 8 x 8 }	50-80	125	.456	44 x 54	5'-0"	44 x 8	2½	1½	6.2	7.8	9.0	10.0	2,675	2,900
Bursary .....	50	Sub-Base { 8 x 8 }	80-110	125	.456	44 x 65	5'-8"	44 x 8	2½	1½	6.2	7.8	9.0	10.0	3,325	3,710
Bustard .....	75	Sub-Base { 8 x 9 }	50-80	125	.662	52 x	5'-4"	52 x 9	3	2	9.3	11.7	13.6	15.0	3,320	3,700
Bustle .....	75	Sub-Base { 8 x 9 }	80-110	125	.662	52 x	6'-4"	52 x 9	3	2	9.3	11.7	13.6	15.0	4,100	4,600
Bustable .....	75	Sub-Base { 8 x 12 }	90-110	120	.70	60 x 72	7'-4"	60 x 10	3½	2	.....	10.5	13.6	15.0	6,200	7,120
Bursten .....	125	10 x 12	70-90	120	1.09	60 x 72	7'-4"	60 x 10	4	2	.....	.....	22.5	24.5	6,400	7,400
Burying .....	200	13 x 12	25-40	120	1.54	60 x 72	7'-4"	60 x 10	5	2½	24.5	.....	.....	.....	6,600	7,600

## BELT-DRIVEN, DOUBLE STAGE.

Buzzing .....	100	13-8 x 12	90-110	120	.92	60 x 72	7'-4"	60 x 10	3½	2	.....	.....	.....	17.0	18.5	6,600	7,230
Bygone .....	200	16-10 x 16	90-110	120	1.86	66 x 92	8'-7"	66 x 15	5	2½	.....	.....	.....	34.0	37.0	9,800	11,400

## Power Air Pressure or Vacuum Pump.

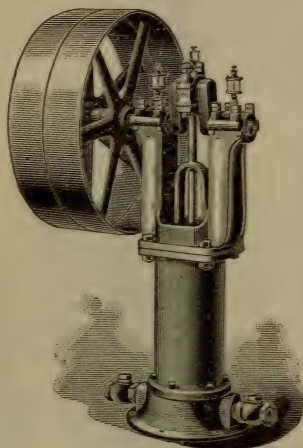


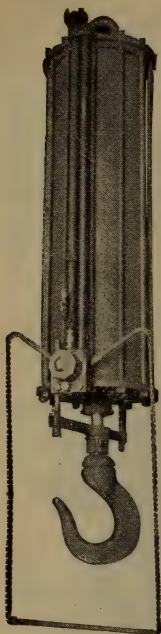
FIG. 1029.

Fig. 1029 represents our Air Pressure or Vacuum Pump, with crank shaft, pitman and guide, arranged with tight and loose pulleys for power.

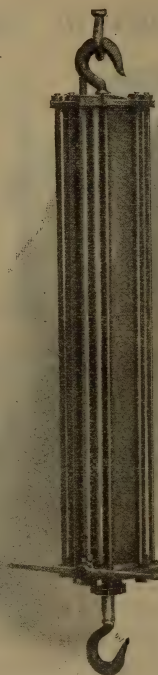
These Pumps have a general application for forcing air into receivers, to agitate liquids, and are also used in connection with the dry-pipe sprinkler system in mills and factories. It may also be used for any purpose where a vacuum is required. Maximum is 100 R. P. M.

FIG. 1029. SIZE, PRICE, ETC.

Plunger		Displacement Free Air per Rev. of Crank Shaft.	Maximum Pressure	Inlet and Outlet.	Tight and Loose Pulleys	Price
Diameter	Stroke					
6 in.	8 in.	226 cubic in.	30 lbs.	1 1/4 in. pipe	24 x 4 in.	\$80.00



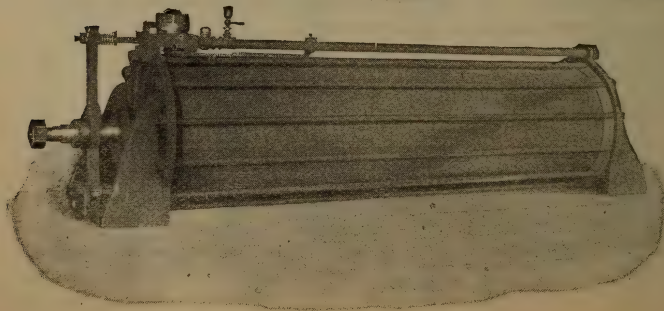
14" x 5 FT. CLASS A.



8" x 4 FT. CLASS C.



8" x 4 FT. CLASS G.

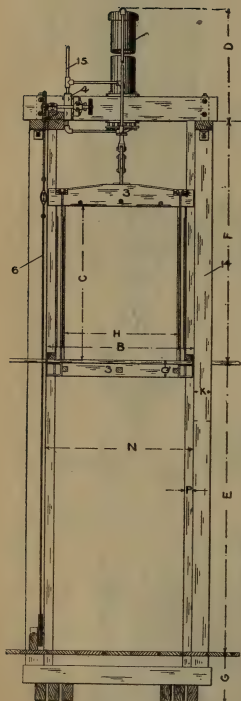
14" x 5 FT.  
CLASS  
B OR H.



# Curtis Class F Air Hoist. (Two-to-One.)

Made to order only. We make many styles of this type hoist and full particulars should accompany order. State whether hoist is to have trolleys or not, and if with trolleys whether for straight or curved track. As these hoists are usually special, we can not accommodate our customers by allowing these hoists to be returned or exchanged, so that orders should be very clear and specific. No trolleys included in prices.

WEIGHTS.				PRICES AND CODE WORDS.		Code Words for Lifts other than four feet to be added to Code Word of Hoist.		DIMENSIONS.											
Net and Packed, Four-foot Lift, Estimated.				Code Words for 4-ft. Lifts. For Lifts other than 4-ft. add Code Words in last two columns.		Code Words for Lifts other than four feet to be added to Code Word of Hoist.		Letters refer to Drawings. Dimensions in inches.											
Nominal Inside Diam.	Capacity, 20% allow.	Pounds.	Kilos.	Net Pounds	Class F.	Class F, Regular 4-Foot Lift.	Additional price for each 6 inch or less of Lift over four feet.	Feet.	CODE WORD.	Inches.	CODE WORD.	Diameter.	A.	B.	C.	D.	E.	F.	G.
6	900	408		280	340	400		0	Burdensome	1	Burgher	6	21	4	4	11	7 1/2	9	16
8	1025	470		340	414	575		1	Burdock	2	Burghar	8	26	5	4 1/2	14	9	11	18
10	1150	532		400	470	675		2	Bureau	3	Burgrave	10	30	6	5	16	11 1/2	14	20
12	1275	594		460	541	800		3	Burganot	4	Burlet	12	35	7	6	18	12	16	24
14	1400	656		520	614	925		4	Burganot	5	Burlet	14	38	8	7 1/2	22	14 1/2	18 1/2	28
16	1525	718		580	680	1000		5	Burganot	6	Burlet	16	43	9	8	24	16	21	31
18	1650	780		640	740	1100		6	Burganot	7	Burlet	18	48	10	9	26	20	26	38
20	1775	842		700	800	1200		7	Burganot	8	Burlet	20	53	11	10	30	24	30	40
22	1900	904		760	860	1300		8	Burganot	9	Burlet	22	58	12	11	32	26	32	46
24	2025	966		820	920	1400		9	Burganot	10	Burlet	24	63	13	12	34	28	34	50
26	2150	1028		880	980	1500		10	Burganot	11	Burlet	26	68	14	13	36	30	36	54
28	2275	1090		940	1040	1600		11	Burganot	12	Burlet	28	73	15	14	38	32	38	60
30	2400	1152		1000	1100	1700		12	Burganot	13	Burlet	30	78	16	15	40	34	40	66
32	2525	1214		1060	1160	1800		13	Burganot	14	Burlet	32	83	17	16	42	36	42	72
34	2650	1276		1120	1220	1900		14	Burganot	15	Burlet	34	88	18	17	44	38	44	78
36	2775	1338		1180	1280	2000		15	Burganot	16	Burlet	36	93	19	18	46	40	46	84
38	2900	1400		1240	1340	2100		16	Burganot	17	Burlet	38	98	20	19	48	42	48	90
40	3025	1462		1300	1400	2200		17	Burganot	18	Burlet	40	103	21	20	50	44	50	96
42	3150	1524		1360	1460	2300		18	Burganot	19	Burlet	42	108	22	21	52	46	52	102
44	3275	1586		1420	1520	2400		19	Burganot	20	Burlet	44	113	23	22	54	48	54	108
46	3400	1648		1480	1580	2500		20	Burganot	21	Burlet	46	118	24	23	56	50	56	114
48	3525	1710		1540	1640	2600		21	Burganot	22	Burlet	48	123	25	24	58	52	58	120
50	3650	1772		1600	1700	2700		22	Burganot	23	Burlet	50	128	26	25	60	54	60	126
52	3775	1834		1660	1760	2800		23	Burganot	24	Burlet	52	133	27	26	62	56	62	132
54	3900	1896		1720	1820	2900		24	Burganot	25	Burlet	54	138	28	27	64	58	64	138
56	4025	1958		1780	1880	3000		25	Burganot	26	Burlet	56	143	29	28	66	60	66	144
58	4150	2020		1840	1940	3100		26	Burganot	27	Burlet	58	148	30	29	68	62	68	150
60	4275	2082		1900	2000	3200		27	Burganot	28	Burlet	60	153	31	30	70	64	70	156
62	4400	2144		1960	2060	3300		28	Burganot	29	Burlet	62	158	32	31	72	66	72	162
64	4525	2206		2020	2120	3400		29	Burganot	30	Burlet	64	163	33	32	74	68	74	168
66	4650	2268		2080	2180	3500		30	Burganot	31	Burlet	66	168	34	33	76	70	76	174
68	4775	2330		2140	2240	3600		31	Burganot	32	Burlet	68	173	35	34	78	72	78	180
70	4900	2392		2200	2300	3700		32	Burganot	33	Burlet	70	178	36	35	80	74	80	186
72	5025	2454		2260	2360	3800		33	Burganot	34	Burlet	72	183	37	36	82	76	82	192
74	5150	2516		2320	2420	3900		34	Burganot	35	Burlet	74	188	38	37	84	78	84	198
76	5275	2578		2380	2480	4000		35	Burganot	36	Burlet	76	193	39	38	86	80	86	204
78	5400	2640		2440	2540	4100		36	Burganot	37	Burlet	78	198	40	39	88	82	88	210
80	5525	2702		2500	2600	4200		37	Burganot	38	Burlet	80	203	41	40	90	84	90	216
82	5650	2764		2560	2660	4300		38	Burganot	39	Burlet	82	208	42	41	92	86	92	222
84	5775	2826		2620	2720	4400		39	Burganot	40	Burlet	84	213	43	42	94	88	94	228
86	5900	2888		2680	2780	4500		40	Burganot	41	Burlet	86	218	44	43	96	90	96	234
88	6025	2950		2740	2840	4600		41	Burganot	42	Burlet	88	223	45	44	98	92	98	240
90	6150	3012		2800	2900	4700		42	Burganot	43	Burlet	90	228	46	45	100	94	100	246
92	6275	3074		2860	2960	4800		43	Burganot	44	Burlet	92	233	47	46	102	96	102	252
94	6400	3136		2920	3020	4900		44	Burganot	45	Burlet	94	238	48	47	104	98	104	258
96	6525	3198		2980	3080	5000		45	Burganot	46	Burlet	96	243	49	48	106	100	106	264
98	6650	3260		3040	3140	5100		46	Burganot	47	Burlet	98	248	50	49	108	102	108	270
100	6775	3322		3100	3200	5200		47	Burganot	48	Burlet	100	253	51	50	110	104	110	276
102	6900	3384		3160	3260	5300		48	Burganot	49	Burlet	102	258	52	51	112	106	112	282
104	7025	3446		3220	3320	5400		49	Burganot	50	Burlet	104	263	53	52	114	108	114	288
106	7150	3508		3280	3380	5500		50	Burganot	51	Burlet	106	268	54	53	116	110	116	294
108	7275	3570		3340	3440	5600		51	Burganot	52	Burlet	108	273	55	54	118	112	118	300
110	7400	3632		3400	3500	5700		52	Burganot	53	Burlet	110	278	56	55	120	114	120	306
112	7525	3694		3460	3560	5800		53	Burganot	54	Burlet	112	283	57	56	122	116	122	312
114	7650	3756		3520	3620	5900		54	Burganot	55	Burlet	114	288	58	57	124	118	124	318
116	7775	3818		3580	3680	6000		55	Burganot	56	Burlet	116	293	59	58	126	120	126	324
118	7900	3880		3640	3740	6100		56	Burganot	57	Burlet	118	298	60	59	128	122	128	330
120	8025	3942		3700	3800	6200		57	Burganot	58	Burlet	120	303	61	60	130	124	130	336
122	8150	4004		3760	3860	6300		58	Burganot	59	Burlet	122	308	62	61	132	126	132	342
124	8275	4066		3820	3920	6400		59	Burganot	60	Burlet	124	313	63	62	134	128	134	348
126	8400	4128		3880	3980	6500		60	Burganot	61	Burlet	126	318	64	63	136	130	136	354
128	8525	4190		3940	4040	6600		61	Burganot	62	Burlet	128	323	65	64	138	132	138	360
130	8650	4252		4000	4100	6700		62	Burganot	63	Burlet	130	328	66	65	140	134	140	366
132	8775	4314		4060	4160	6800		63	Burganot	64	Burlet	132	333	67	66	142	136	142	372
134	8900	4376		4120	4220	6900		64	Burganot	65	Burlet	134	338	68	67	144	138	144	378
136	9025	4438		4180	4280	7000		65	Burganot	66	Burlet	136	343	69	68	146	140	146	384
138	9150	4500		4240	4340	7100		66	Burganot	67	Burlet	138	348	70	69	148	142	148	390
140	9275	4562		4300	4400	7200		67	Burganot	68	Burlet	140	353	71	70	150	144	150	396
142	9400	4624		4360	4460	7300		68	Burganot	69	Burlet	142	358	72	71	152	146	152	402
144	9525	4686		4420	4520	7400		69	Burganot	70	Burlet	144	363	73	72	154	148	154	408
146	9650	4748		4480	4580	7500		70	Burganot	71	Burlet	146	368	74	73	156	150	156	414
148	9775	4810		4540	4640	7600		71	Burganot	72	Burlet	148	373	75	74	158	152	158	420
150	9900	4872		4600	4700	7700		72	Burganot	73	Burlet	150	378	76	75	160	154	160	426
152	10025	4934		4660	4760	7800		73	Burganot	74	Burlet	152	383	77	76	162	156	162	432
154	10150	5000		4720	4820	7900		74	Burganot	75	Burlet	154	388	78	77	164	158	164	438
156	10275	5062		4780	4880	8000		75	Burganot	76	Burlet	156	393	79	78	166	160	166	444
158	10400	5124		4840	4940	8100		76	Burganot	77	Burlet	158	398	80	79	168	162	168	450
160	10525	5186		4900	5000	8200		77	Burganot	78	Burlet	160	403	81	80	170	164	170	456
162	10650	5250		4960	5060	8300		78	Burganot	79	Burlet	162	408	82	81	172			



Curtis Pneumatic Elevators. Type 2.—(Direct-Acting.)

## DIMENSIONS.

## LIST PRICES.

Diarm. Hoist Cyl.	80 lbs. Air Pressure.	Net Capacity in pounds.	Size Piping.	Auxiliary Valve.		Weight of Complete Cage, w/o t. ft.	Weight Irons only	Timbers.		Supporting Frame.		Complete as specified below.	Additional per foot of Lift to Cage.	Extra.		Extra. Wood Support Frame, Knocked down.		Extra. Steel Supp't Frame, Knocked down.		Extra. Hard Maple Cage Guides. Only 10 ft. Lift.	Deduct.		Shipp'g Wt. of extra Lift.	
				Main Valve.				Size of Up-rights.	Size of Steel Columns.	Channels.	Add. for Pipe for 10 ft. Lift.			Add. per ft. of Lift for Pipe.	For 10 ft. Lift.	For each ft. add.	For 10 ft. Lift.	For each ft. add.	If no Cage is wanted.		If Irons only for Cage are ordered.			
1	2		3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
6"	1000	1 1/2	1	1	9	46	6x6	6"																
8"	1700	1 1/2	1	1	900	400	6x8	6"																
8"	2300	1 1/2	1	1	900	400	6x8	6"																
9"	2900	1 1/2	1	1	1000	460	8x8	7"																
10"	4000	1 1/2	1	1	1100	480	8x8	7"																
12"	6000	2	2	1	1200	490	8x10	8"																
14"	9000	2 1/2	4	1	1300	500	8x10	8"																
15000	2 1/2	4	1	1	1400	510	8x10	8"																

**Columns 1-2**—Capacity allows for 20 per cent friction and 10 per cent drop in air pressure and full weight of cage. Greater or less air pressure will give proportionate capacity. All parts designed for 110 lbs. working pressure. Maximum lift 24 feet for this type.

**5-6**—These weights are subject to considerable variation.

**7-8**—These weights are many times stronger than actually required—see "Carnegie" hand-book, ed. 1896, p. 202—but smaller supports would not look well in place.

**11**—Price includes hoist cylinder complete: cage with 6 foot x 7 foot platform, with safety appliances complete; valves, main and auxiliary supports, buffers and connections, and necessary rope necessary.

**12**—Includes the necessary pipe, fittings, valves and necessary rope necessary.

**13**—Includes all the necessary pipe, fittings, valves and necessary rope necessary.

**15-16**—Includes iron base plate for columns, which can be bolted to timber or concrete. The parts usually furnished: maple, parts all painted and plainly marked to show how to assemble. Necessary bolts for erecting turni. bed.

**19**—Includes only the 3 1/2 x 3 1/2 dressed hard maple guides.

**21**—Larger cages—6 feet x 7 feet, to 7 feet x 8 feet, add 10 per cent over price of 6 feet x 7 feet; and for 7 feet x 8 feet, to 8 feet x 9 feet, add 20 per cent to price of 6 feet x 7 foot cage.



## Curtis Single I Beam Traveling Crane.

[illegible]

Price of a Crane of intermediate span in proportion to length.

**NOTE.**—Price includes an ungeared plate steel roller-bearing trolley. Beams figured for 8,000 lbs. maximum fiber stress and loads 25% greater than above capacities may be handled with ample safety.



## Double I Beam Traveling Cranes.

Depth of Steel I Beams.	Code Word for Crane and Trolley. No. Pendant Chain. No Hoist. See Code Word below for Span and Extras.		Span measured from center to center of Supporting Rails. Use a good steel tape and give average reading. Wheels permit of a variation of 1 inch total. Capacity in pounds.					Price of Extras, Dollars.		Net Weight, Pounds.		DIMENSIONS (In Inches).																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
			Span in feet and hundredths thereof.					Bridge Propelled by Pendant Chain.	Trolley Propelled by Pendant Chain.	20' Crane.	Each Foot Extra Span.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
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10"	Veromandu	Capacity Price	6,000	5,000	3,500	3,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Code for Span and Extras see Table of Single I Beams. Price includes Roller-Bearing Trolley, ungeared.

NOTE.—Hook of trolley is level with the top of rail.

Beams figured for maximum fiber stress of 8,000 lbs. Rated

capacity can be exceeded 25% with ample safety.



Made to Work  
on

Standard Sections.

Wheels Roller-Bushed  
and with or without  
Chain Wheel.



Sides of Steel Plate  
allow the  
Wheels to Equalize  
the Load.

• •

In ordering state whether  
for Curved or Straight  
Trackway.

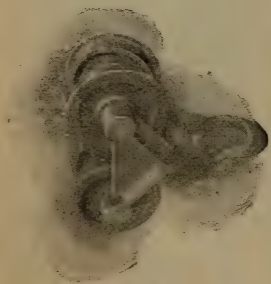
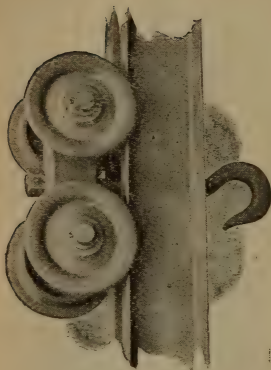
## Plate Steel Trolley for Single I Beams.

Used on Curtis I Beam Cranes.

Self-Equalizing Side Frames.

Height of Steel I Beam	Capacity, Pounds.	PLAIN TROLLEY—NO GEARING.			GEARED TROLLEY, WITH PENDANT HAND CHAIN.			DIMENSIONS.										
		Price.	Code Word.	Weight.	Price.	Code Word.	Weight.	A	B	C	D	E	F	G	H	I	J	K
6 inch	2,000 lbs.		Vesibus	80		Vesontis	150	6	5½	7	3½	4½	4½	5½	3½	9	5½	4
8 "	7,000 "		Vescianos	100		Vesoul	180	8	7½	9	4	8	6	6½	4½	9	7½	4½
10 "	10,000 "		Vesicular	150		Vestates	250	10	9	11	4½	8½	6½	7	5½	13	8½	5½
12 "	14,000 "		Veseris	200		Vesticius	300	12	11½	13	5	9½	7	8	5½	13	9½	5½
15 "	18,000 "		Vesevas	250		Vestitium	350	15	14½	16	5½	10	8	8½	6½	13	11	6

**NOTE.**—Small wheels cannot be expected to run as easily as larger wheels, and while we have succeeded in building a remarkably light-running trolley when compared to the ordinary trolley on the market, yet a load of 5,000 pounds on four small wheels will not run without considerable effort. We, therefore, advise our customers to select trolleys and trackway with reference to wheel diameters and ease of running rather than by capacity to hold a certain load. At one-third to one-half the capacities given the above trolleys will run freely without use of any pendant hand chains.



### Solid Steel Frame I Beam Trolleys.

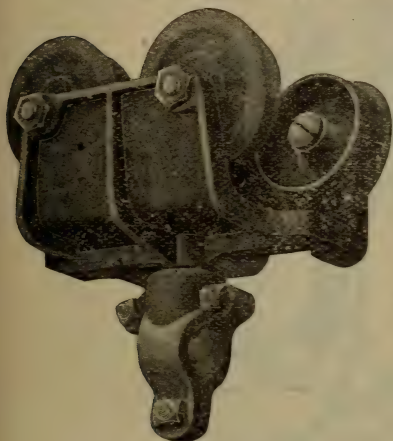
For Maximum load of pounds.	Size of I Beam.	I Beam weighs per foot.	Price of one Trolley.	CODE WORD.	Largest size Air Hoist adapted for.	DIMENSIONS.						Dimensions in inches.
						A	B	C	D	E	F	
3,000	6 inch	12¼ pounds		Hydracid	7 inch	6	7½	6½	6	5	3.33	
7,000	8 "	18 "		Hydrant	10 "	8	9	8	8	6½	4	
12,000	10 "	25 "		Hydrocele	12 "	10	11½	10	10	8	4.66	

### Double Beam Trolley.

Adapted to Hoists with inside diameter of	Letters refer to drawings. Dimensions in inches.										PRICES AND CODE WORDS:		
											No Hoist included.		Code Word.
											With Plain Bearings.	With Roller Bushings.	
	A	B	C	D	E	F	Weight net, no Hoist (pounds)				Price.	Cole Word.	
3 inch to 6 inch	9	12½	10	6	1½	8½	78					H. drogen	Pyrum
7 " and 8 "	12	13½	12	8	1½	8	142					Hydrology	Hyperbola
9 " 10 "	15	14½	13	10	1¼	9	211					Hydrometer	Hypericon
12 " 14 "	18	16½	18	12	2	10	380					Hydrophathy	Hyphen
15 " 16 "	21	17½	21	14	2½	11	465					Hydrophane	Hyponology

## HOSE-CARRYING TROLLEYS.

IN ORDERING STATE OUTSIDE DIAMETER OF HOSE.

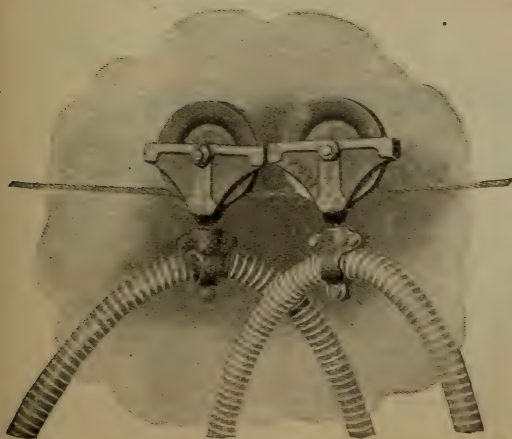


**I Beam Trolley.**



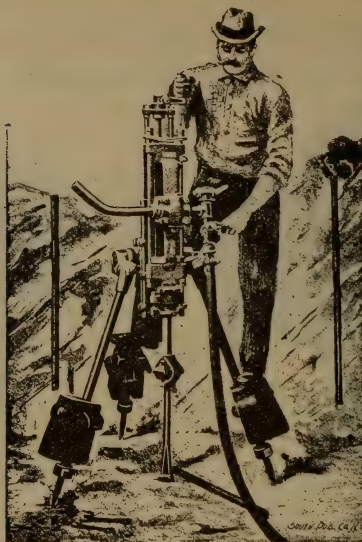
**Bar Trolley.**

For  $\frac{1}{2} \times 2$ ,  $\frac{5}{8} \times 3$ , and  $\frac{3}{4} \times 4$  Bars.



**Cable Trolley.**

The accompanying cuts show three means of carrying an hose for moving hoists. All have swivel clamps to hold the hose. The I beam trolley follows behind a trolley carrying an air hoist and an I beam. The cable trolley is good for medium spans, without any curves. The bar trolley for long spans or curves.



THE "NEW INGERSOLL" ROCK DRILL, 1898 PATTERN.

The "New Ingersoll" Rock Drill is made up of the best features of the Ingersoll and the Sergeant, with certain improvements in design and material which have been developed by recent experience.

It contains the improved Sergeant release rotation.

The improved "Eclipse," independent and indestructible valve movement.

The Sergeant shell and saddle side rods, cross-head and crank.

No buffers within the cylinder.

The Sergeant gland and a new oval-shaped elastic chuck key.

It is lighter in weight because of improvements in design and the use of malleable iron and steel.

Variable stroke and an uncushioned blow.

Adapted for hard rock and ore.

Easily handled in soft or seamy rocks.

For use with either steam or air.

The Sergeant Universal joint, light tripod.

Mounted on tripod, column, shaft bar or quarry bar.

Guaranteed to be without an equal in drilling capacity, combined with lightness of weight and economy of repairs.

Your repair bills should be cut 30 per cent. by the use of the "New Ingersoll."

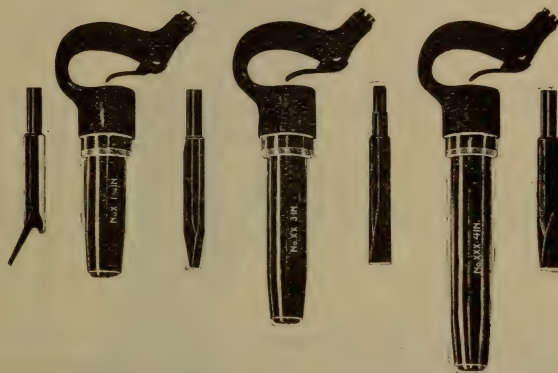
We have built 25,000 rock drills. Our shops at Easton, Pa., are now producing more than 1,800 rock drills per annum.

This experience has developed the "New Ingersoll."

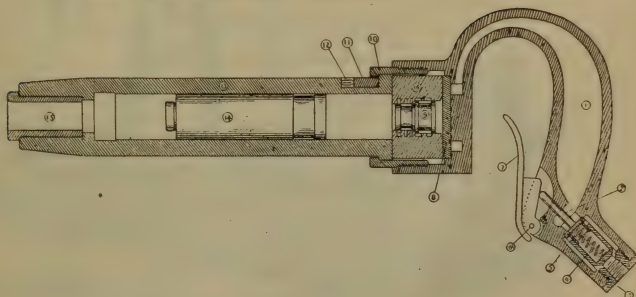
If interested in mining, tunneling or quarrying, send for our special catalogue No. 41 of rock drills, quarry bars, gadders, stone channeling machines, etc., etc.



# Pneumatic Tools.



- No. X. For light caulking and flue beading. Weighs 8 lbs.  
 No. XX. For general chipping and caulking. Weighs 9 lbs.  
 No. XXX. For heavy chipping, caulking and light riveting. Weighs 10 lbs.



Sectional View of 1½", 3" and 4"

## LIST OF PARTS

- |                        |                      |
|------------------------|----------------------|
| 1. Handle              | 9. Valve.            |
| 2. Latch Valve Pin.    | 10. Coupling Sleeve. |
| 3. Latch Valve Casing. | 11. Dog              |
| 4. Latch Valve Spring  | 12. Dog Screw.       |
| 5. Latch Valve.        | 13. Barrel.          |
| 6. Latch Pin.          | 14. Plunger.         |
| 7. Latch.              | 15. Tool Nose        |
| 8. Valve Block Button. | 16. Valve Block      |

# SCAIFE GALVANIZED AIR TANKS.



Appreciating the uncertainty of hydraulic tests when applied to cylinders used for holding air or gas under pressure, we exercise especial care in having these tanks **thoroughly tested under air pressure**. They are tapped for any sized connection and possess a beautiful finished appearance.

Tested to any pressure.

Seams **brazed** when desired.

Capacity.	Size.	Price Galvanized.
5 gals.	18 in. by 9 in. dia.	\$ 8 00
8 "	29 " 9 " "	9 50
10 "	36 " 9 " "	11 00
10 "	22 " 12 " "	11 00
15 "	30 " 12 " "	13 50
18 "	36 " 12 " "	14 50
21 "	42 " 12 " "	15 50
24 "	48 " 12 " "	15 75
30 "	60 " 12 " "	19 00
40 "	60 " 14 " "	24 00
52 "	60 " 16 " "	31 00



PNEUMATIC  
COATING MACHINES

For Whitewashing and Painting.

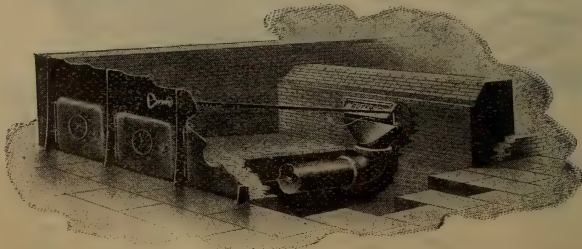
Price 50.00

THIS MACHINE

Has steel receptacle 7 inches in diameter, with powerful 24-inch brass pump, 25 feet of high-grade pneumatic hose, 5 feet of wire-wound suction hose, with strainer, extension pipe, three spraying nozzles, and is complete, as shown in cut, excepting sieve.

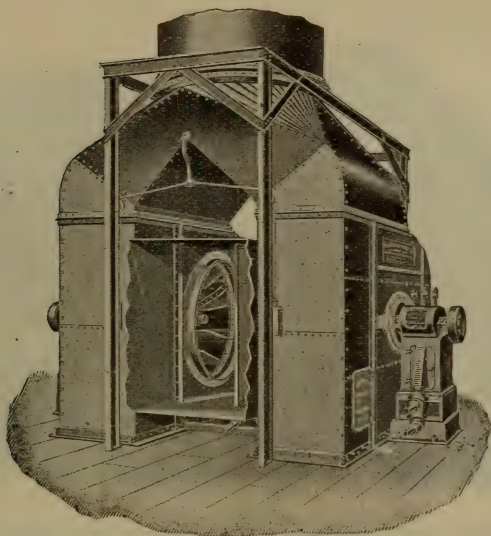
**MECHANICAL FORCED DRAFT.****ILLUSTRATION OF BOILERS EQUIPPED WITH BUFFALO MECHANICAL FORCED DRAFT.**

Mechanical Forced Draft is a means of creating draft by supplying air under pressure to the boiler grates. The pressure is produced by a fan blowing into the ash pit, as shown by the upper illustration. The lower engraving shows another method of introducing air to the furnace and also illustrates how simple it is to regulate the draft to just the amount of air necessary for the proper combustion of the fuel used. Some of the advantages of forced draft over natural draft are the same as those of Induced Draft, given on next page.

**BUFFALO FORCED DRAFT DAMPER IN POSITION.**



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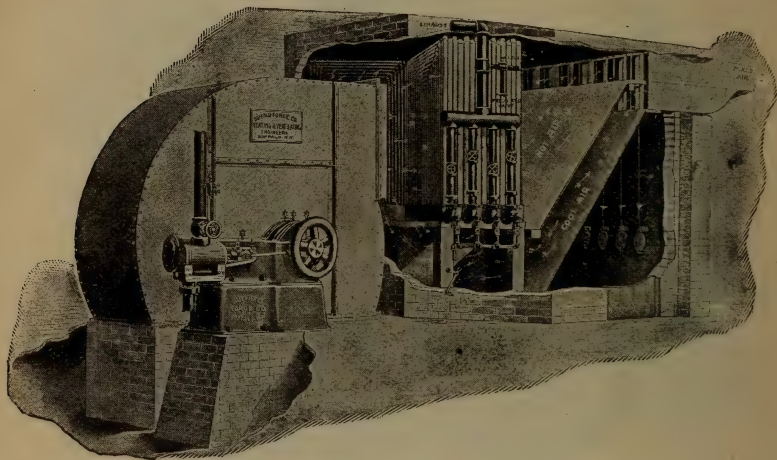
**MECHANICAL INDUCED DRAFT.**

**BUFFALO INDUCED DRAFT FANS WITH DOUBLE ENCLOSED  
ENGINES, OVERHUNG FAN WHEELS AND  
WATER-COOLED BEARINGS.**

Mechanical Induced Draft, as applied to boilers, refers to the method of producing draft by means of exhaust fans placed between the boiler uptake and the short, light stack. Special fans are built to suit the exigencies of varying situations.

Some advantages of Induced Draft are as follows: Uniform draft of the required intensity. Initial cost far less than a chimney. Operating expense below the interest on a smoke stack outlay. Independence of atmospheric conditions secured. The highest possible efficiency of combustion afforded. Low grades of fuel burned. Steaming capacity advanced to a maximum. Enables waste heat of gases to be utilized. Prevents smoke. Saves fuel. Is flexible, positive and instantaneous.

## FAN SYSTEM OF HEATING, VENTILATING AND DRYING.



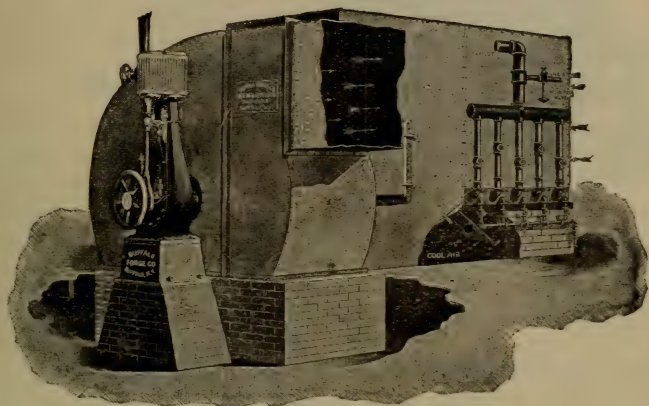
THREE-QUARTER HOUSING FAN BLOWING AIR THROUGH AND UNDERNEATH HEATER.

The Buffalo Fan System has become a recognized factor in all that is best in heating and ventilating methods. A fan is employed to force air through heaters and on into the space to be heated. A by-pass is also provided so that some of the air may pass the heaters without being heated. Distribution to different points is made through ducts, and thermostats may be used if desired for automatically controlling the temperature.

The Buffalo System is used in industrial buildings, churches, schools, opera houses, court houses, and in fact in all classes of buildings where a positive, unailing system of heating and ventilating is required.

The low installation cost has never been the main argument in favor of the fan system, yet it is often less than other systems. The reduction of the coal bill shown by plants in actual practice has caused a widespread application of the Buffalo Fan System.

## FAN SYSTEM OF HEATING, VENTILATING AND DRYING.

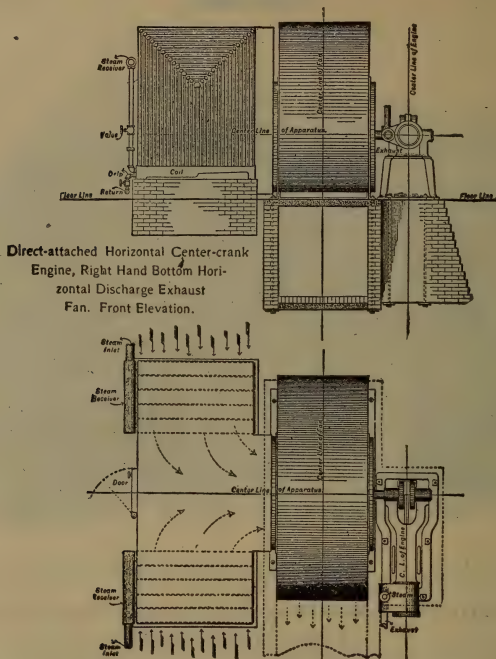


THREE-QUARTER HOUSING FAN, DRAWING THROUGH HEATER, WITH COLD AIR BY-PASS UNDERNEATH.

The illustration shows a three-quarter housing Buffalo Fan of steel plate, with direct attached upright engine, cylinder above shaft, exhausting through heater, with cold air by-pass underneath. This outfit is a common form for the heating and ventilating of public buildings and is the simplest and most compact arrangement built. Various types of fans may be employed to suit the requirements of different situations.

The advantages of the fan system are numerous. The heating surface is concentrated and heat losses are reduced to a minimum. Absolute control over temperature, humidity and air volume is afforded. It is the only adequate system of supplying the amount of air necessary for good ventilation. The excess of pressure indoors obviates all cold air leaks from without. The apparatus is confined to a room in basement and flues in the wall, and occupies no space in the rooms to be heated.

## FAN SYSTEM OF HEATING, VENTILATING AND DRYING.



VIEWS OF SINGLE FAN AND DUPLEX HEATER.

In order to reduce to a minimum the space occupied, the fans of large apparatus are built in the three-quarter housing form, exhausting through the heaters. Fan discharges may be either top or bottom horizontal, up or down blast, or to deliver air in two directions, as may be best suited to existing conditions. The heaters may be grouped in one, two, three or more divisions. This is governed by their size and work to be performed.

The condensation and heating capacity from a given amount of properly designed radiation is from three to five times greater with a forced circulation of air than in ordinary plants. The heater designed for a fan system must therefore provide for positive and unusual condensation, that the coils may be invariably hot. Buffalo Heaters are offered as excelling any other obtainable.



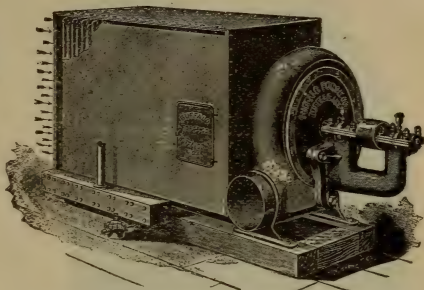
## FAN SYSTEM OF HEATING, VENTILATING AND DRYING.

Where a small outfit is required for drying fruit, wool, cotton, grain, leather, glue, tobacco, or any substances requiring more or less rapid evaporation of moisture, these outfits have found great favor. Very little power is required to operate the plant.

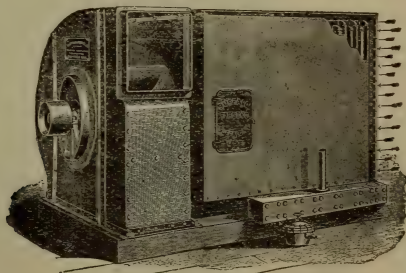
Two styles of exhausters are employed, i. e., Buffalo "B" Volume Exhausters and Buffalo Steel Plate Exhaust Fans. When the latter fan is used it is made of heavy steel plate rigidly braced, as is the casing of the heater coils. The "B" Volume Blowers are constructed of cast iron and have a solid frame and shell. Ring oiling bearings are supplied on both styles.

These plants are extensively used to dry and heat large basements. They give entire satisfaction. The fans may be arranged for driving by belt, engine or motor.

The Buffalo Fan System Dry Kiln represents the adaptation of the latest ideas upon the subject of lumber drying. Its simplicity and efficiency account for its extensive adoption.



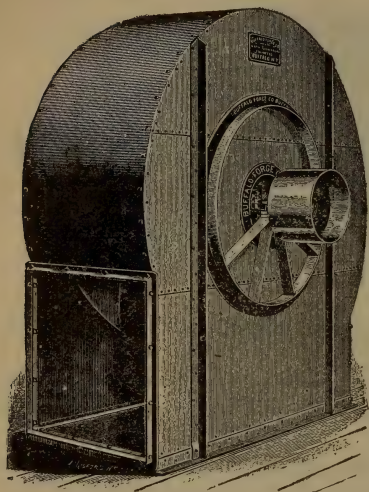
BUFFALO "B" VOLUME EXHAUSTER, DRAWING THROUGH HEATER.



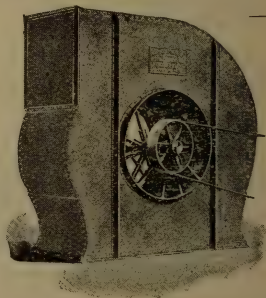
BUFFALO STEEL PLATE PULLEY EXHAUST FAN, DRAWING THROUGH HEATER.

## STANDARD STEEL PLATE FANS.

These fans are constructed of heavy steel plate and are reinforced at the base with angle irons, while the sides of sheet steel are also rigidly braced and stiffened. The wheels are built of heavy steel plate with heavy wrought-iron spiders, and are strongly constructed and carefully balanced.



BUFFALO STEEL PLATE FAN, BOTTOM HORIZONTAL DISCHARGE, FULL HOUSING TYPE.



BUFFALO STEEL PLATE PULLEY FAN, TOP HORIZONTAL DISCHARGE, FULL HOUSING TYPE.

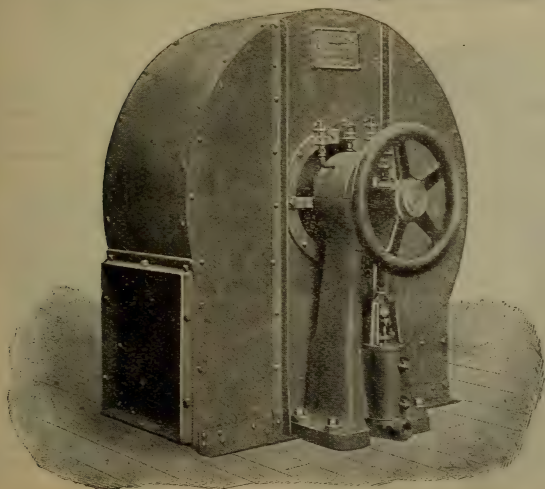
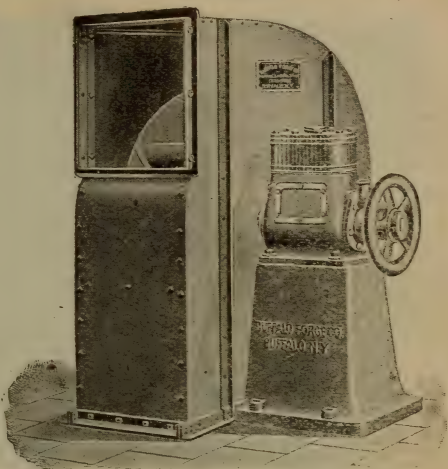
## PRICE LIST FULL HOUSING BLOWERS AND EXHAUSTERS.

Size of Fan, Inches	Size of Outlet	Diam. of Inlet	Pulleys		Average Speed	Cu. Ft. Air at One Oz. Pres.	Price of Pulley Fan
			Diam.	Face			
50	18 $\frac{1}{2}$ x 18 $\frac{1}{2}$	24 $\frac{3}{4}$	9	7	693	11440	\$ 110.00
60	22 $\frac{1}{4}$ x 22 $\frac{1}{4}$	26 $\frac{3}{8}$	10	8	650	16120	140.00
70	26 x 26	34 $\frac{1}{4}$	11	9	509	22880	180.00
80	29 $\frac{3}{4}$ x 29 $\frac{3}{4}$	39 $\frac{1}{8}$	12	10	426	30160	240.00
100	37 $\frac{1}{4}$ x 37 $\frac{1}{4}$	45 $\frac{3}{4}$	16	12	340	48360	400.00
110	41 x 41	51 $\frac{1}{2}$	18	13	307	58240	500.00
120	44 $\frac{3}{4}$ x 44 $\frac{3}{4}$	54 $\frac{3}{8}$	20	14	280	69680	650.00
130	48 $\frac{1}{2}$ x 48 $\frac{1}{2}$	61	22	15	263	82160	800.00
140	52 $\frac{1}{4}$ x 52 $\frac{1}{4}$	64 $\frac{3}{4}$	24	16	248	95160	1000.00
150	56 x 56	69 $\frac{1}{2}$	26	17	227	109200	1250.00
160	59 $\frac{3}{4}$ x 59 $\frac{3}{4}$	74 $\frac{1}{4}$	28	18	209	124800	1500.00
170	63 $\frac{1}{2}$ x 63 $\frac{1}{2}$	79	30	19	197	140920	1700.00

**STEEL PLATE ENGINE FANS.**

The upper illustration shows a right-hand, top horizontal discharge fan, with hand wheel and enclosed engine.

The lower illustration is of a right-hand, bottom horizontal discharge fan, with engine of the single vertical type. This engine is especially designed and adapted for fan driving, and has the cylinder below the shaft.

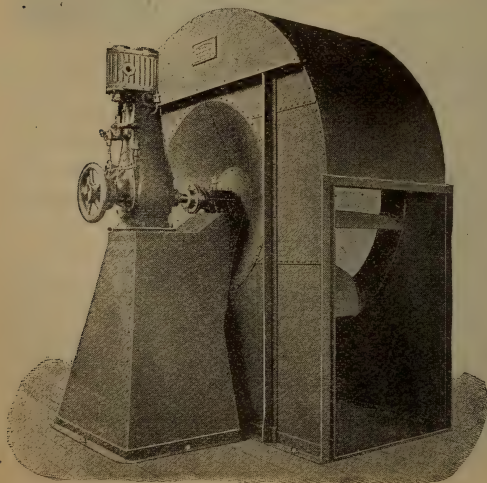
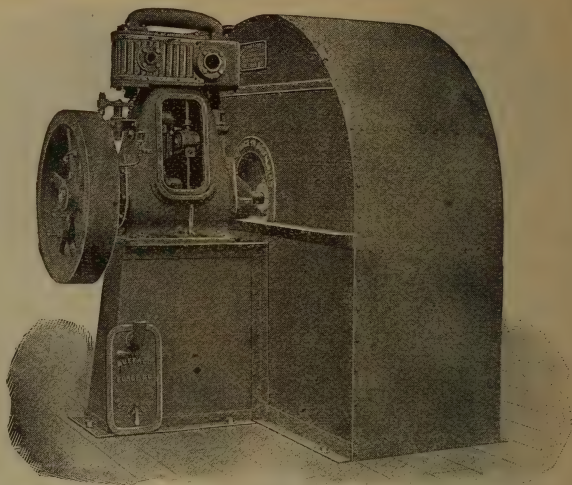


These fans are built of any desired capacity or to discharge in any direction, and are extensively used for mechanical draft.

The steel plate sides of the fan, as well as the base, are reinforced with angle iron. Overhung wheels and water-cooled bearings may be supplied if desired.

## STEEL PLATE ENGINE FANS.

The illustrations of these pages show fans of various types built for different requirements. A knowledge of the conditions and work to be performed is required to determine the size and type necessary. In design, material and workmanship, they are strictly modern products.



Buffalo Steel Plate Fans with Buffalo heaters are used for drying fruit, wool, cotton, grain, leather, glue, tobacco, jute, fibrous material, lumber and brick. Buffalo fans are employed in the best modern heating and ventilating plants, for producing forced and induced draft, and for conveying light materials.

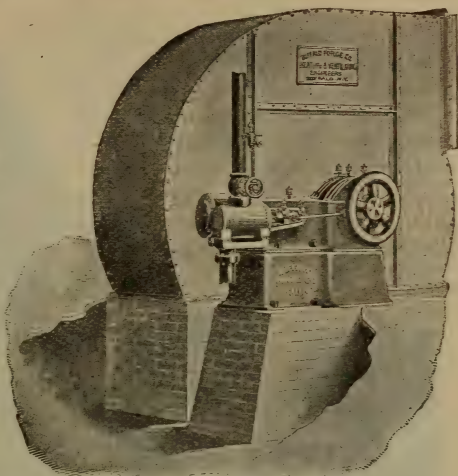
The two fans of this page are both of the full housing type, the first an up-blast fan with upright cross-compound engine, and the second a bottom horizontal discharge fan with standard Buffalo Single Vertical Engine.



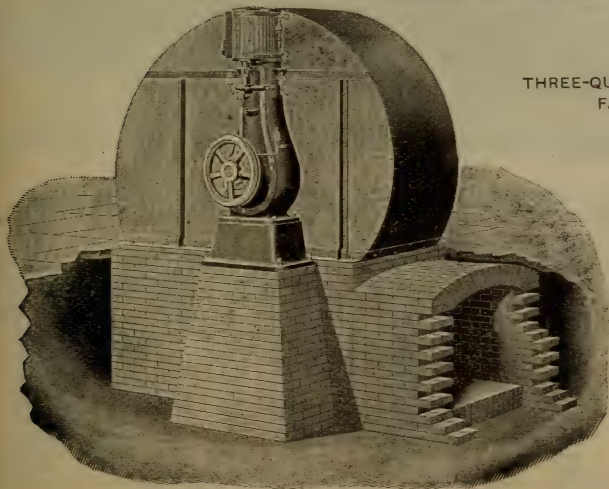
**STEEL PLATE ENGINE FANS.**

Buffalo Steel Plate Fans are adapted to ventilating and drying purposes. They are provided with standard Buffalo oil-ring bearings, and may be run by pulley or direct connected to a Buffalo Horizontal or Vertical Engine or to a standard motor.

In the majority of applications of large steel plate fans for any service, much can be gained in convenience of arrangement by three-quarter housing form. These fans show a uniform ratio of proportion, dimensions and capacities existing throughout all sizes. Fans of no other manufacture show like regularity in construction details.

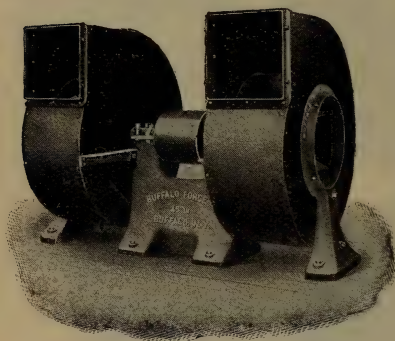


THREE-QUARTER HOUSING  
FAN TYPES.

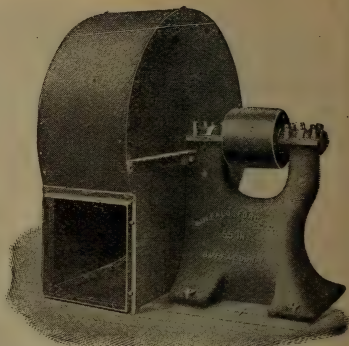


## PLANING MILL EXHAUST FANS.

These fans have been especially designed for exhausting saw-dust, shavings, dust, and other light material, and are also largely employed for conveying cotton, wool, spent tanbark, etc. They are strongly built of steel plate, with overhung wheels, ring oiling bearings and heavy cast-iron bearing standards. The proportions of these fans render their efficiency of the highest.



BUFFALO DOUBLE PLANING MILL EXHAUSTER.  
TOP HORIZONTAL DISCHARGE.

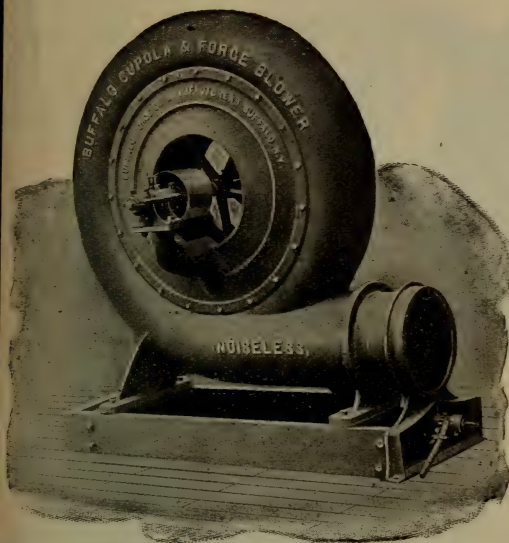


BUFFALO SINGLE PLANING MILL  
EXHAUSTER.  
BOTTOM HORIZONTAL DISCHARGE.

### SINGLE FANS—PRICE LIST AND DIMENSIONS.

Size.	Outside Diameter of Inlet.	Outside Size of Outlet.	Single Fan Pulleys.		Price of Single Fans.
			Diameter.	Face.	
30-inch	11 $\frac{1}{4}$	9 $\frac{1}{2}$ x 9 $\frac{1}{2}$	6	4 $\frac{1}{2}$	\$ 55.00
35 "	13 $\frac{1}{8}$	11 $\frac{1}{4}$ x 11 $\frac{1}{4}$	7	5 $\frac{1}{2}$	70.00
40 "	15 $\frac{1}{8}$	13 $\frac{3}{8}$ x 13 $\frac{3}{8}$	8	6	90.00
45 "	16 $\frac{1}{8}$	15 x 15	9	6 $\frac{1}{2}$	115.00
50 "	19	16 $\frac{1}{4}$ x 16 $\frac{1}{4}$	10	7	150.00
55 "	20 $\frac{7}{8}$	18 $\frac{1}{8}$ x 18 $\frac{1}{8}$	11	8	185.00
60 "	22 $\frac{5}{8}$	19 $\frac{5}{8}$ x 19 $\frac{5}{8}$	11 $\frac{1}{2}$	9	200.00
70 "	24 $\frac{3}{4}$	22 $\frac{1}{4}$ x 22 $\frac{1}{4}$	12	10	250.00
80 "	30 $\frac{1}{2}$	26 x 26	14	10 $\frac{1}{2}$	300.00

## STEEL PRESSURE BLOWERS.



The manner in which Buffalo Steel Pressure Blowers are constructed and in which the bearings are affixed, adapt the machine for standing up under continuous high-pressure service. The solid peripheral shell, with the side plates securely fastened thereto, allows a tight fit to be made, resulting in a blower of maximum strength and rigidity. The long, adjustable bearings of the standard Buffalo oil ring-type are so carried as to preclude incorrect alignment.

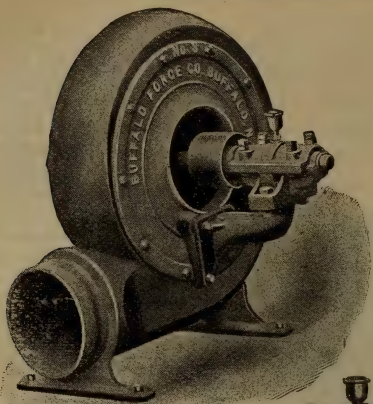
Buffalo Steel Pressure Blowers may be furnished with adjustable beds, and countershafts and may be arranged for driving by belt, engine or motor. They are especially adapted for cupola blast service.

BUFFALO STEEL PRESSURE BLOWER,  
ADJUSTABLE ON BED WITH TELESCOPIC MOUTH PIECE.

## PRICE LIST OF BLOWERS WITH ADJUSTABLE BEDS AND COUNTERSHAFTS.

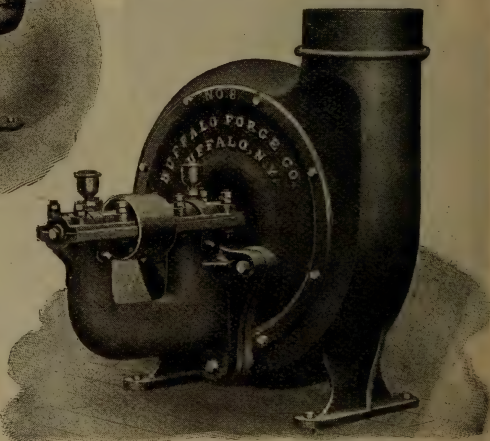
Number of Blower	Outside Diameter of Outlet	Pulleys		Price of Blower Only	Price with Bed but without Countershaft	Price with Bed and with Countershaft.
		Diameter	Face			
6	6 $\frac{1}{4}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$	\$ 55.00	\$ 90.00	\$120.00
7	7 $\frac{1}{4}$	5	4 $\frac{1}{2}$	70.00	100.00	135.00
8	8 $\frac{1}{8}$	6	4 $\frac{1}{2}$	90.00	130.00	175.00
9	10	7	5	115.00	170.00	230.00
10	12 $\frac{1}{4}$	8	5 $\frac{3}{4}$	160.00	265.00	350.00
11	14 $\frac{3}{8}$	9	6 $\frac{1}{4}$	225.00	330.00	435.00
11 $\frac{1}{2}$	16 $\frac{1}{2}$	10	7	275.00	380.00	500.00
12	18	10	8	325.00	475.00	625.00

## "B" VOLUME BLOWERS AND EXHAUSTERS.



BUFFALO "B" VOLUME  
BLOWER.

The Buffalo "B" Volume Exhausters are well adapted for exhausting forge fire smoke, and for removing particles from emery wheels, buffing wheels and saws. They are built of the same material as the blowers and give a heavy suction and expulsive force.



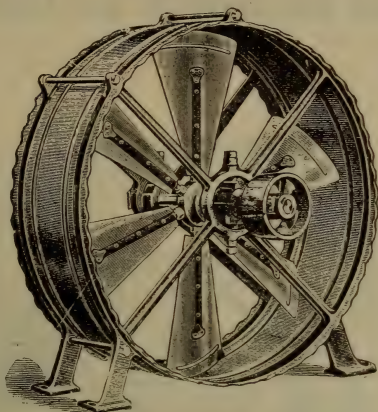
BUFFALO "B" VOLUME EXHAUSTER.

TABLE OF PRICE LIST AND DIMENSIONS.

No. of Blower.	Height in Inches.	Outside Diameter of Outlet.	Pulleys.		Price.
			Diameter.	Face.	
000 B	14 $\frac{1}{2}$	4 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{1}{4}$	\$ 15.00
1 B	15 $\frac{3}{4}$	5	3	2 $\frac{1}{2}$	20.00
2 B	20 $\frac{1}{4}$	6	3 $\frac{1}{4}$	2 $\frac{5}{8}$	25.00
3 B	25	7 $\frac{1}{2}$	4	3 $\frac{1}{4}$	33.00
4 B	29	9	5	4	44.00
5 B	32	10 $\frac{1}{2}$	5 $\frac{3}{4}$	4 $\frac{1}{2}$	55.00
6 B	37 $\frac{1}{2}$	12	6 $\frac{1}{2}$	5 $\frac{1}{2}$	70.00
7 B	43	14	7 $\frac{1}{2}$	6 $\frac{1}{2}$	90.00
8 B	48	16 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	150.00
9 B	55	18	9 $\frac{1}{2}$	8 $\frac{1}{2}$	200.00
10 B	68	21	12	10	250.00
11 B	79	24	14	12	350.00



## WING'S DISC FAN.



Wing's Disc Fan or Exhauster, as shown above, has many advantages over other Exhaust Fans. We mention a few of the principal ones.

It will move more air than any other Fan made for heating, ventilation, drying, etc., as competitive trials have shown. The blades are curved and have an expanding pitch, thereby increasing the amount of air moved, and reducing the slippage.

**PRICE LIST OF**  
**Wing's Disc Fans or Exhausters.**

No. 1.	12 inches diameter,	8 inches wide,	Pulley, 2x1 1/4,	\$30 00
" 2.	18 "	10 "	" 3x1 1/2,	40 00
" 3.	24 "	12 "	" 4x2,	50 00
" 4.	30 "	13 "	" 5x3,	65 00
" 5.	36 "	14 "	" 6x3,	85 00
" 6.	42 "	15 "	" 7x4,	105 00
" 7.	48 "	16 "	" 8x4,	125 00
" 8.	54 "	17 "	" 9x5,	160 00
" 9.	60 "	18 "	" 10x6,	200 00

**SKELETON FANS.**

No. 10.	72 inches diameter,	Pulley, 12x 7,	- - -	\$200 00
" 11.	84 "	" 14x 8,	- - -	250 00
" 12.	96 "	" 16x10,	- - -	300 00
" 13.	108 "	" 20x12,	- - -	400 00
" 14.	120 "	" 24x12,	- - -	500 00

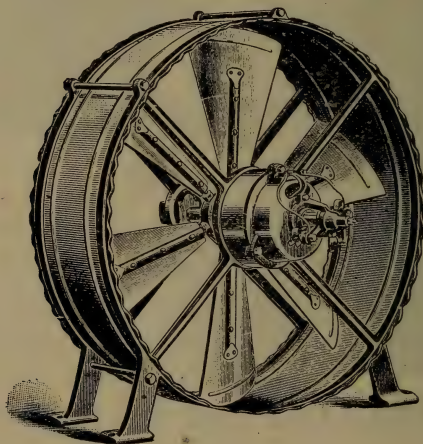
Prices for extra sizes given on application.

Fans fitted to run horizontally from \$6.00 to 15.00 extra.

PRICE LIST OF  
**Wing's Disc Fans and Electric Motor Combination.**

18 inch Fan, with	$\frac{1}{4}$ H. P. Electric Motor,	\$150 00
24 " " " "	$\frac{1}{2}$ " " "	245 00
30 " " " "	$\frac{1}{2}$ " " "	260 00
36 " " " "	1 " " "	325 00
42 " " " "	2 " " "	435 00
48 " " " "	4 " " "	630 00
54 " " " "	4 " " "	665 00
60 " " " "	5 " " "	780 00

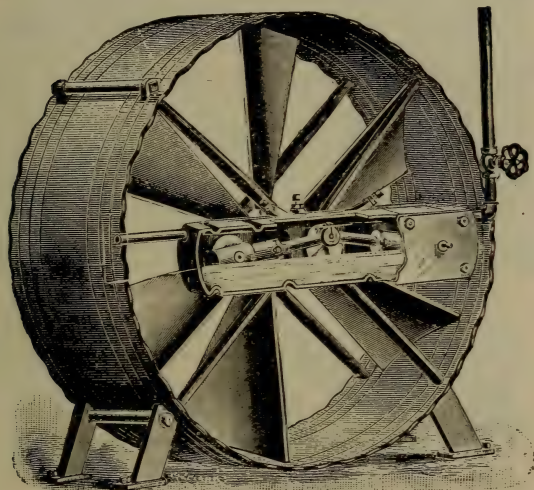
Sizes of Electric Motors as given in the above table means the size and power of Motor at its full speed in ordinary work, but they do not use that amount of power at the low rate of speed that the Fan run.



These Electric Motors are built as a part of the Fan and require the minimum power for driving. They do not obstruct the light, are practically noiseless, and in fact the very best application of power for Heating, Ventilating, Cooling, etc.

PRICE LIST OF  
Wing's Disc Fan and High Speed Engine Combination.

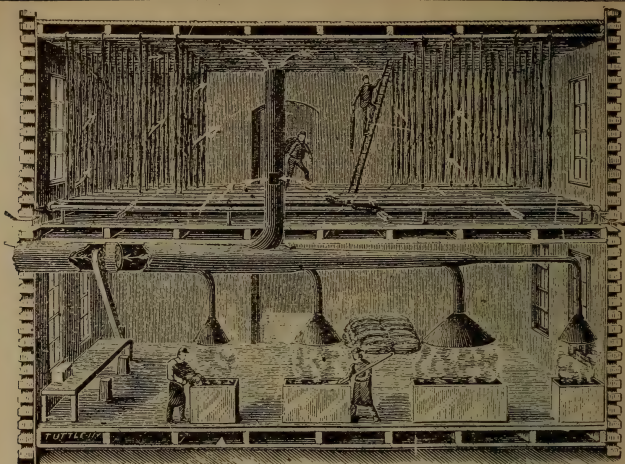
36 inch Fan, with Engine and Lubricator,	\$225 00
42 " " " "	265 00
48 " " " "	310 00
54 " " " "	420 00
60 " " " "	500 00



PATENT NO. 303 496.

These Engines are placed on the Fan frame and Shaft, and are practically a part of the Fan, being neat, compact and light, will run with very little care, thus making them desirable for places where parties have steam, but no engine, or wish to place the Fan at some isolated spot, or for running at night when the large engine is shut down. Very convenient and cheap for night drying in factories, or for heating buildings.

**Please Note.**—The Fan and Engine Combination is arranged for 60 lbs. of steam, and is not intended to run at the higher speeds



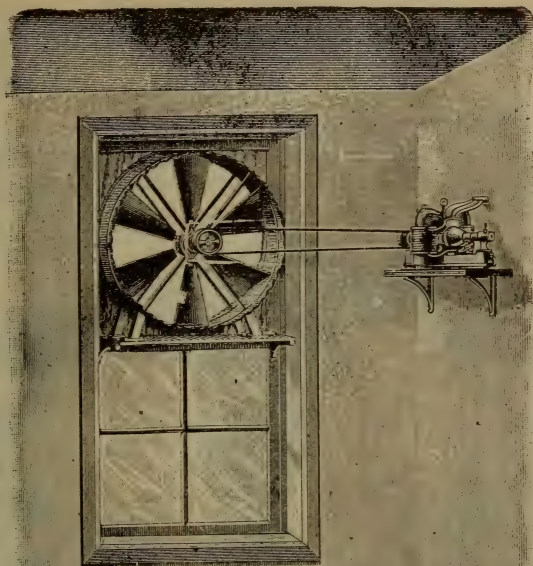
The above engraving shows one method of piping a room and by means of hoods collecting the steam, dust or gases where they originate, at the moment of their escape, so that they are prevented from spreading throughout the room or building.

For steam, gas, etc., the hoods would preferably be placed above, and for dust, heavy fumes, etc., either at the side or below the point where they originate.

The illustration also shows a room on next floor arranged for drying. The air is conducted under and about steam pipes, so placed as to heat the room by radiation, and the air so heated is then passed through and between articles hung in room, and thence to pipe or pipes communicating with main pipe to Fan, which is thus made to serve for two or more rooms.

There are many other methods of drying, of which we do not give illustrations, but we shall be pleased to give advice to manufacturers who wish to improve their drying arrangements.





SIZE OF FAN.	REVS. PER MINUTE.	SIZE OF FAN.	REVS. PER MINUTE.
12 inch.	800 to 1,800	48 inch.	350 to 700
18 "	700 to 1,500	54 "	300 to 600
24 "	600 to 1,200	60 "	300 to 550
30 "	500 to 1,000	72 "	300 to 450
36 "	450 to 900	84 "	250 to 400
42 "	400 to 800	96 "	200 to 300

This engraving shows our Fan placed in the window. This is the cheapest and in many cases the best method of adaptation. By the peculiar construction of Wing's Disc Fan the blades cannot be seen when running, and therefore, they do not obstruct the light any; a very essential point, and one which no other fan possesses. All other fans obstruct the light from one half to three quarters.

In this position, as in many other cases, any noise is objectionable, and in this respect also our Fan is far ahead of all competitors—being practically noiseless.

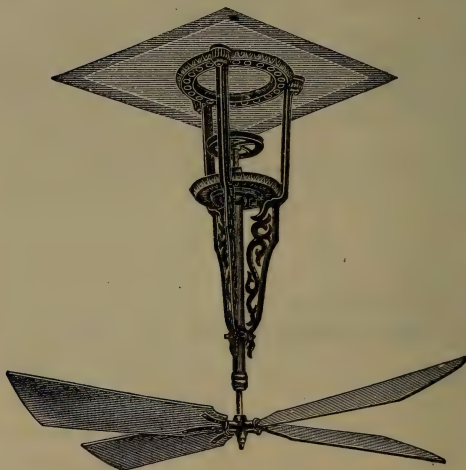
2d.—A very valuable advantage of our Fan in this or any other position is the adjustable blades. A fan placed for exhausting air during cold or moderate weather can in hot weather be changed to blowing in fresh air and thus giving anything from a gentle rephyr to a "Sea-side breeze" inside of a room or rooms. If you are troubled with heat in the summer remember this fact. **NO OTHER FAN WILL DO THIS.**

## Specialty Ceiling Fans

Are the Lightest Running.

RICH, ORNAMENTAL DESIGN

Each Fan has Four Mahogany Finished Blades  
Handsomely Finished in Maroon Enamel and Nickel



Fans are Listed 7 feet 6 inches from Floor to Center of Blades.

For Ball Bearings add \$1.25 net Extra.

No charge for Packing and Boxing.

**NOTICE.**—If you wish quotations on Ceiling Fan outfit, give following information: Rough sketch of room; number of fans; location of each fan and distances apart; location of main or counter shaft; length of same if wanted, and distance from fans; round or flat belt; height of ceiling; if to be operated by water motor,

**GIVE WATER PRESSURE.**

## Specialty Ceiling Fans.

**CAUTION.**—In the absence of instructions these Fans are regularly shipped with grooved pulleys for round belts. Can furnish with flange pulleys for flat belts if desired.

### PRICE LIST.

Ht. of Ceiling.	Price. Code Name.	Ht. of Ceiling.	Price. Code Name.
8 feet.....	\$14 00—Udal	12 feet 6 inches.....	\$19 00—Ultra
8 " 6 inches.....	14 50—Udaler	13 ".....	19 50—Umbel
9 ".....	15 00—Udder	13 " 6 inches.....	20 00—Umbo
9 " 6 inches.....	16 00—Ukase	14 ".....	20 50—Umbrage
10 ".....	16 50—Ukase	14 " 6 inches.....	21 00—Umbrage
10 " 6 inches.....	17 00—Ukase	15 ".....	21 50—Umpire
11 ".....	17 50—Ukase	15 " 6 inches.....	22 00—Unarm
11 " 6 inches.....	18 00—Ukase	16 ".....	22 50—Unawed
12 feet.....	18 50—Ult		

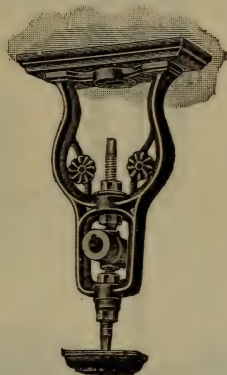


**Grooved Pulley Idler,**

With ornamental base. Used for turning corners with round horizontal belt.

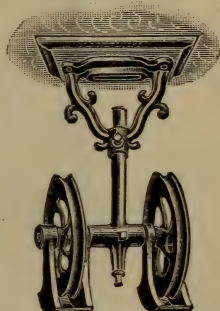
**Price, \$3.00**

Code name, "UTTER."



**Ornamental Hanger.**

Furnished with 8-in., 10-in. and 12-in. drop.



**Grooved Pulley Belt Carrier**

With ornamental base. For carrying or supporting belts running long distances.

**Price, \$3.50**

Code name, "UTTERED."

### Miscellaneous Parts Used for Running Specialty Fans.

ALL PARTS ARE WELL FINISHED IN JAPAN.

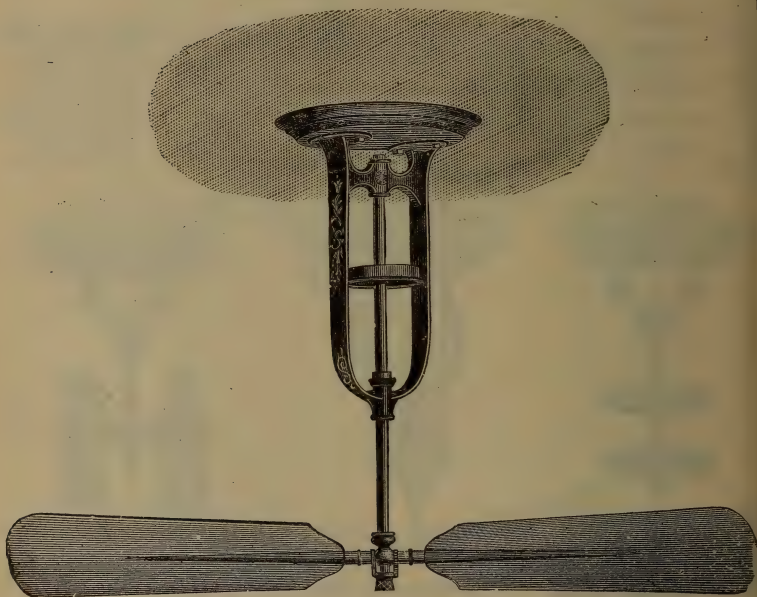
	Price. Code Name.
4-in. groove pulley.....	\$ 80—Unbend
5 " " ".....	1 00—Unbent
8 " " ".....	2 50—Unbias
10 " " ".....	3 50—Unbid
12 " " ".....	25—Unbit
13 " " ".....	3 50—Unbolt
11 " " ".....	4 00—Unclog
18 " " ".....	5 00—Unclose
" pulley, single flange	1 50—Undo
" " " ".....	1 75—Undoing
" " " ".....	2 00—Undid
" " " ".....	2 25—Undone

### ORNAMENTAL HANGERS FOR COUNTER AND LINE SHAFT.

	Price. Code Name.
8 in.....	\$2 75—Uncurl
10 ".....	3 00—Uncurling
12 ".....	3 25—Uncurled
5/8 " shaft coupling..	1 75—Uncloud
5/8 " collar.....	25—Uncork
Best round belt, with coupling,	
per ft.,	12—Uncover
1 in. flat belt,	14—Uncovering
1 1/2 " " ".....	24—Uncovered

For prices of Counter and Floor Column Belt Fans, see page 18.

## CEILING FAN.



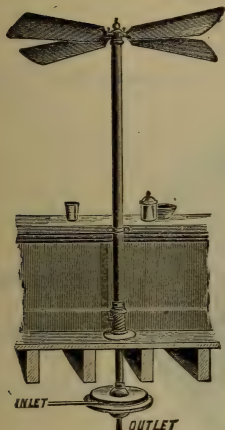
Bronzed, with varnished base and blades and common carrier.

12 inch drop.....	\$ 7 00	} Short Frame.
18 inch drop.....	7 50	
2 feet drop .....	8 00	
2 feet 6 inch drop.....	11 50	} Long Frame.
3 feet 0 inch drop.....	12 00	
3 feet 6 inch drop .....	12 75	



## Triumph Counter Column Water Fan.

Price, \$30.00.



To stand against the counter.

Code Name, "SABLE."

## Triumph Floor Column Water Fan.

Price, \$36.00.



To stand out in the floor.

Code Name, "SAFETY."

CAUTION.—Patented Dec. 8, 1896.

## STATE WATER PRESSURE.

ABOVE FANS WILL BE FURNISHED WITH LOWER BEARINGS  
AND PULLEY FOR BELT POWER INSTEAD OF MOTOR.

Counter Column Fan, Belted, Price, \$30.00.—Code name, "Uveous."

Floor Column Fan, Belted, Price, \$36.00.—Code name, "Uvula."

## Junior Water Desk Fan—Single.

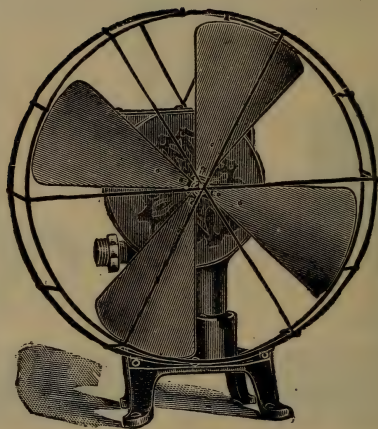
For use on the Ordinary House Service and Waste.

Diameter of Blades, 13 inches.

ECONOMICAL.

EFFICIENT.

DURABLE.



LOW PRICE

VERY NEAT.

ATTRACTIVE.

Patent Applied For.

Price, \$7.50.

Code Name, "JUNIOR."

STATE WATER PRESSURE.

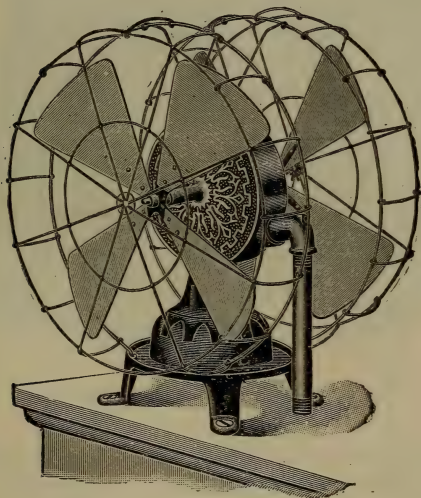
# Triumph Water Desk Fan—Double.

Diameter of Blades, 13 inches.

FOR USE ON ORDINARY HOUSE SERVICE AND WASTE.

Only Double Water Fan Made.

NEAT      ATTRACTIVE      EFFICIENT      ECONOMICAL      DURABLE



Patent Applied For.

Price, \$12.00.

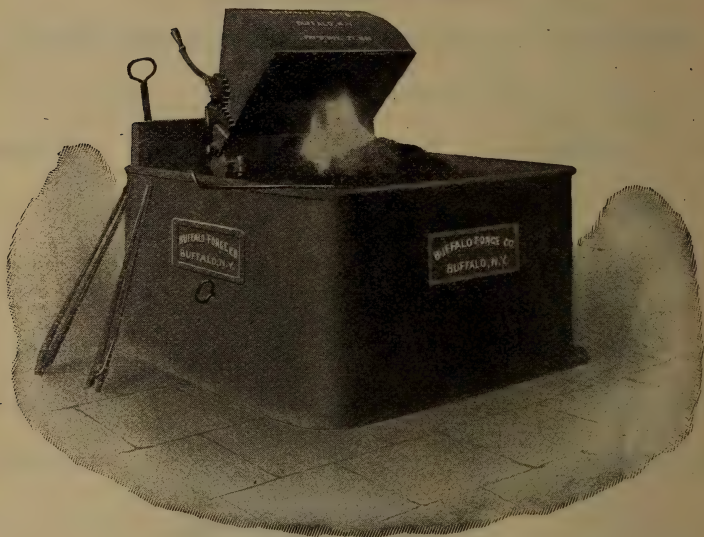
Code name, "SWIFT."

When ordering, state if Iron Pipe or Hose Fittings are Wanted.

**STATE WATER PRESSURE.**

**DOWN DRAFT FORGES.**

PATENTED NOV. 27 1894.



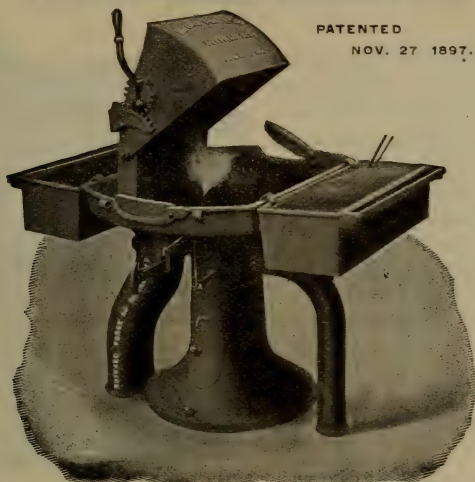
No. 0D. BUFFALO DOWN DRAFT FORGE.

In the Buffalo Down Draft System of forge construction all pipes, both blast and exhaust, are placed underground, and all smoke is immediately and completely removed through the adjustable exhaust hood at the side. No repairs are necessitated. Buffalo Blowers and Exhausters are installed to serve these forges.

Buffalo Down Draft Forges allow no escape from the largest and heaviest fires, have no overhead piping systems and are almost indestructible. The first cost is moderate. A large range of types and sizes adapt them to all requirements. They are almost universally adopted by modern manual training schools and the list of users in the industrial world is a convincing testimonial of merit. It is the most durable and efficient system of forge construction known.



## DOWN DRAFT FORGES.



PATENTED

NOV. 27 1897.

No. 02D. BUFFALO DOWN DRAFT FORGE.

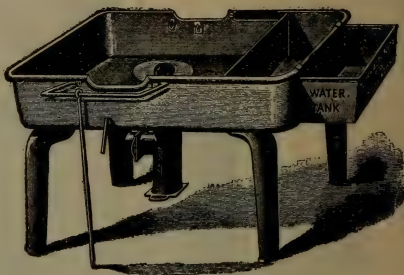
## BUFFALO DOWN DRAFT AND STATIONARY BLAST FORGES.

Number	Fire Pan	Height	Weight	Price
1S	21 x 27 $\frac{1}{4}$	30 $\frac{1}{2}$	89	\$15.00
0S	26 $\frac{3}{4}$ x 38 $\frac{1}{4}$	33	140	20.00
0SD	26 $\frac{3}{4}$ x 38 $\frac{1}{4}$	33	270	50.00
02	24 x 36 $\frac{1}{2}$	29	360	34.00
02D	24 x 36 $\frac{1}{2}$	29	470	65.00
00S	38 x 42	26 $\frac{1}{2}$	412	40.00
00ST	38 x 42	26 $\frac{1}{2}$	435	45.00
03	46 $\frac{1}{2}$ x 47	26 $\frac{1}{2}$	722	70.00
03D	46 $\frac{1}{2}$ x 47	26 $\frac{1}{2}$	1022	110.00
09	37 x 41	27 $\frac{1}{4}$	447	40.00
09D	37 x 41	27 $\frac{1}{4}$	550	70.00
0A	42 x 42	24	1385	On
0D	42 x 42	24	1540	application
07	36 in. diam.	26	330	75.00
07N	36 " "	26	235	36.00
07F	36 " "	26	310	80.00
07I	36 " "	26	430	70.00
07T	36 " "	26	410	100.00
07C	36 " "	26	530	90.00
04	23 x 51	27	570	75.00
05	24 x 54	30	585	80.00
05A	24 x 54	30	610	110.00
06	46 $\frac{1}{2}$ x 53 $\frac{1}{2}$	30	680	125.00

## STATIONARY BLAST FORGES.

Buffalo Stationary Forges are constructed in a large variety of types, and are provided with Buffalo Anti-clinker dumping tuyeres. Coal boxes and water tanks may likewise be furnished.

These forges, though light in appearance, are very strong. Repairs are seldom, if ever, required. In fact, as regards durability and efficiency, they are unequalled.



No. OOS. STATIONARY BLAST FORGE WITH  
BLAST GATE, WATER TANK AND  
COAL BOX.

### BUFFALO IMPROVED BLAST GATES

for controlling the flow of air in blast pipes are of two types, the slide and the lever pattern as shown by the accompanying illustrations.



LEVER PATTERN BLAST GATE.

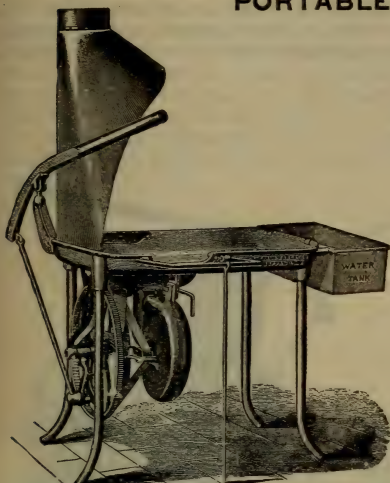


SLIDE PATTERN  
BLAST GATE.

TABLE OF SLIDE PATTERN  
BLAST GATES.

Size.	Inside Diam.	Axial Length	Price.
2	13 $\frac{1}{4}$	3	\$1.00
2 $\frac{1}{2}$	21 $\frac{1}{4}$	3 $\frac{1}{2}$	1.25
3	23 $\frac{1}{4}$	4	1.50
4	37 $\frac{3}{8}$	5 $\frac{1}{4}$	2.00
5	43 $\frac{1}{4}$	5 $\frac{3}{4}$	2.25
6	53 $\frac{1}{4}$	7	2.50
8	77 $\frac{3}{8}$	8 $\frac{1}{4}$	3.50
10	95 $\frac{3}{8}$	9	5.00
12	111 $\frac{1}{2}$	9	6.50
14	131 $\frac{1}{2}$	8 $\frac{1}{4}$	8.00
16	151 $\frac{1}{4}$	9 $\frac{3}{4}$	12.00
18	171 $\frac{1}{2}$	9 $\frac{1}{4}$	16.00
20	191 $\frac{1}{4}$	8 $\frac{1}{4}$	18.00
24	231 $\frac{1}{2}$	9 $\frac{3}{4}$	21.00

## PORTABLE FORGES.



No. 0. BLACKSMITH'S FORGE,  
"THE OLD RELIABLE."

## BUFFALO BLACKSMITHS' FORGE No. 0.

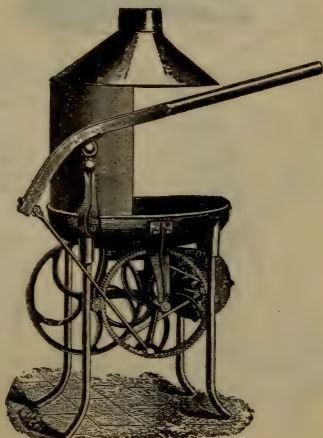
As the name indicates, this is especially adapted for blacksmiths. Every progressive smith and metal worker in the country will readily appreciate the great superiority of these machines to the bellows and the brick forge. Much room, time, labor and money are saved. The forge is guaranteed to produce a welding heat on 3-inch iron in five minutes; on 4-inch in ten minutes. Its equal has not yet been produced.

## BUFFALO MACHINISTS' FORGE No. 1.

This has a half-open hood, and is guaranteed to yield a welding heat on 2½ and 3-inch iron in from five to ten minutes; it will do heavier work if required. For all kinds of tool work, for machinists, plumbers, miners, marble works, millers, railroad repair shops, locksmiths, planters and repairs in general, it possesses superior merit.

Smiths readily appreciate the great superiority of these machines to the bellows and brick forges. They heat much quicker, with less labor, and exceed in durability and reliability. Much room, time, labor and worry are saved.

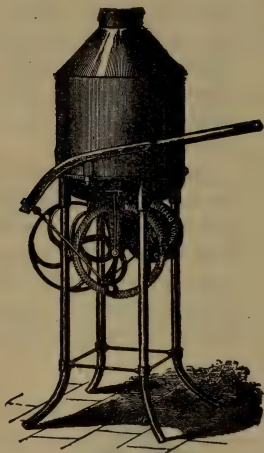
All running gears are heavy, strong and easily operated. The blowers are the regular Buffalo Steel Pressure Blowers, and give a strong steady blast. There is no dead center or back motion in the Buffalo Portable Forges.



No. 1 HAND FORGE, WITH  
OPEN HOOD.

## PORTABLE FORGES.

The best steel shafts are used in the Buffalo Hand Forges, and those furnished with hoods have the metal work built of steel plate. A very extensive variety of these forges enable choice to be made for any requirement. Several styles of collapsible folding forges are also included.



No. 6 HAND FORGE, WITH CLOSED HOOD.



No. 3 HAND FORGE, WITH DASH.

### PRICE LIST, SIZES, WEIGHTS AND PRINCIPAL DIMENSIONS.

No. of Forge	Height to Top of Bowl	Size of Hearth	Diam- eter of Fan	Weight		Price	
				Without Tank	With Tank	Without Tank	With Tank
0	30 in.	28 x 40 in.	14 in.	250 lbs.	300 lbs.	\$50.00	\$54.00
1	29 "	21 x 27 "	10 "	140 "		40.00	
2	21 "	21 x 27 "	10 "	150 "		42.00	
3	29 "	21 x 27 "	10 "	140 "		36.00	
4	33 "	18 in. diam.	6 "	80 "		27.00	
5	33 "	18 " "	6 "	75 "		24.00	
6	33 "	18 " "	6 "	80 "		30.00	
7	15 "	15 " "	6 "	40 "	{ With Case 55 lbs.	16.00	{ With Case \$20.00
8	15 "	15 " "	6 "	50 "		18.00	
9	15 "	15 " "	6 "	55 "		20.00	
10	32 "	18 " "	6 "	110 "		32.00	
11	17½ "	18 " "	6 "		65 lbs.		\$26.00



**HAND BLOWERS.**

For temporarily ventilating underground passages when steam power is not available Buffalo Hand Forges have found wide favor. Some designs are made for such work as expelling smoke and fumes resulting from blasting operations. They are also extensively used in connection with old brick forges, while other designs are especially adapted for blowing flange fires in boiler shops and extra heavy service in shipsmith shops.



No. 4 HAND BLOWER, WITH TUYERE.

PRICE \$36.00.

All material is selected with reference to durability. The bearing and shaft are very carefully prepared. Weights are reduced to a minimum, rendering the Buffalo Hand Blower readily portable.

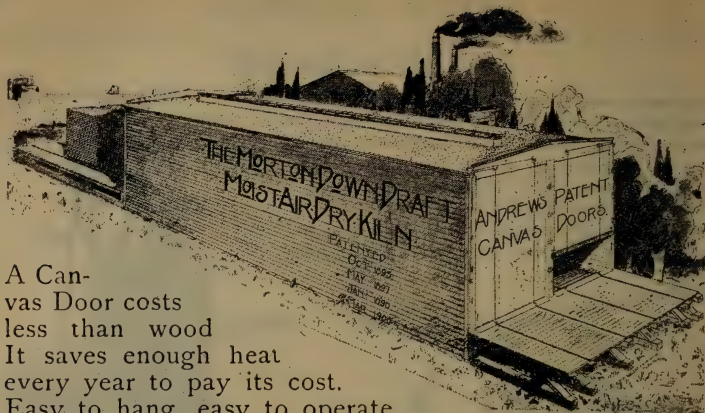


No. 7 DOUBLE CRANK HAND BLOWER.

PRICE \$32.00.



No. 6 HAND BLOWER FOR BRICK FORGES, ETC. PRICE \$28.00.



A Canvas Door costs less than wood  
It saves enough heat every year to pay its cost.  
Easy to hang, easy to operate.

#### THE EQUIPMENT.

We state in answer to prospective customers that we equip every Dry Kiln with the Morton System of Piping; this includes the Headers and necessary steam pipes, valves, fittings, expansion pipes cut and threaded, Tank Steam Trap, all complete as shown on pages 18 and 19. The T-Rails and fastenings, Fixtures for hanging the Doors, sufficient Channel Steel Roller Bearing Cars to fill the Room and for one day's run, the thermometers and all iron parts required to make each room complete within itself.

Every Equipment includes the Plans in Detail, the Specifications and Schedule of the materials for the erection of the Building that is simple and not expensive to build; specific instructions and detailed working plans for the installation of the heating apparatus. Any intelligent mechanic can erect the building and install the apparatus.

We furnish, when desired, Cotton Canvas Doors, Steel Posts to carry the rails and pipes, 30 or 35 lb. rails, Roller Bearing Transfer Cars and Tracks, Turn Tables, Roofing, Building Paper, Automatic Fire Extinguishers and the services of skilled mechanic to superintend the erection of the Building and install the Apparatus.

## Kiln Drying Lumber.

The secret of our success in drying lumber is in the way we control and direct the circulation of air in the kiln.

We deal with the circulation of air scientifically; we construct each kiln for the particular work it is to do; and the movement of air is so controlled in each case that the moisture-laden air may be held in the room at any degree of moisture, and discharged automatically.

The constant supply of fresh dry air is scientifically provided; and by carefully adjusting the system of outlets in relation and proportion to inlets, the greatest amount of work is accomplished in the shortest time. It is simply nature's plan, perfected and assisted.

There is no danger from fire in this kiln; no fire has ever been started in a Morton kiln.

We furnish also a special automatic steam trap with each outfit. Our lumber piling cars are set on roller bearings.

If you want a lumber drying kiln, or if you ought to have one, we shall be glad to give you a figure on the Morton kiln, specially designed and built for your requirements.

# Specialty Water Motor.

For Driving All Kinds of Machinery.

Sizes: 8-in., 12-in., and 16-in.

HIGHEST EFFICIENCY

NOISELESS

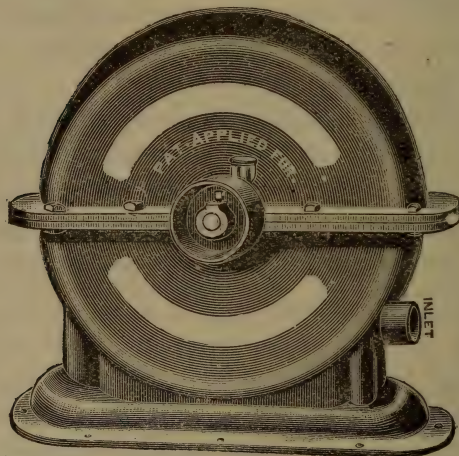
BEST CONSTRUCTION

MOST ECONOMICAL WATER CONSUMPTION

MOST DURABLE

NEVER LEAK

NEVER FREEZE



INTERCHANGEABLE JETS

OUR MOTORS ARE THE BEST

OUR PRICES ARE THE LOWEST

STATE WATER PRESSURE.

Price, see page 25.

Discounts on application.



## Specialty Water Motor.

Inquiries regarding information as to proper sized motor to perform certain work should be accompanied with the following data: Water pressure on street main at the point where motor is to be used; and distance of motor from street main; description of machine to be operated; horse power required; also give about the speed required for machine.

On receipt of above data we will send full particulars as to motor required, etc., and if our directions are followed we will guarantee results, or refund price of motor upon its return to us.

## Specialty Motor.

A high grade water motor. All cities having water works can use the Specialty Motor for all kinds of power.

Table Showing Price, Pressure, Horse Power, Speed, Size of Pipe, Size of Motor, Etc., on Pressure of 30 to 150 Pounds.

Size	Pulley	Horse Power	Jets	Size of Inlet Pipe	Speed	Price	Code Name	Weight	Weight boxed for Export
No. 6	Cone 1½ & 2 in.	$\frac{1}{10}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{8}$	$\frac{1}{2}$ inch	1200 to 2500	\$25.00	Aqueous	15 lbs.	35 lbs.
8 in.	2x1½ inch	$\frac{1}{8}$ to $1\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{8}$	1 "	600 to 1500	30.00	Aqua	34 "	50 "
12 "	3x2 "	$\frac{1}{4}$ to $1\frac{1}{2}$	$\frac{1}{8}$ to $\frac{1}{4}$	1¼ "	450 to 1100	40.00	Aquatic	55 "	75 "
16 "	4x2½ "	$\frac{1}{2}$ to 3	$\frac{1}{8}$ to $\frac{3}{8}$	1½ "	300 to 900	50.00	Aquarium	85 "	115 "
20 "	5x3 "	1 to 4	$\frac{1}{8}$ to $\frac{3}{8}$	2 "	250 to 750	100.00	Acquaint		
0 in. Duplex	5x3 "	$\frac{1}{4}$ to 6	$\frac{1}{4}$ to $\frac{3}{8}$	2 "	250 to 750	125.00	Acquaint		
6 in. Triple	5x3 "	$\frac{1}{2}$ to 8	$\frac{1}{4}$ to $\frac{3}{8}$	2½ "	250 to 750	150.00	Acquit		

### Combination Brass Valve and Jet Holder for

20-inch Single Motor.....	\$ 4.00 Net extra
20-inch Double Motor.....	7.50 " "
20-inch Triple Motor.....	12.50 " "

# **BABBITT METAL.**

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## **C. & J. GENUINE METAL.**

This is made from the original Babbitt formula, with great care to preserve the purity of its constituents. It contains no lead, spelter, scrap, or other impurities, and can be relied upon to give the best results, not only for general work, but for the lining of all heavy bearings, where severe usage may be expected. While greater in first cost than other lining metals, its strength, high lubricating qualities, fluidity, and freedom from dross after repeated melting cause the best engineers to pronounce it the most economical in use. **Price, 45 cents per pound.**

## **GRANITE METAL.**

This formula is the last formula made by us. There was quite a demand for a metal not so expensive as the Genuine Babbitt, but of a higher grade than the metals manufactured and known as antifriction metals.

The Granite metal, can be used in all cases where the babbitt can be used. The formula of this metal conforms more nearly to that of the metal known as the genuine babbitt than any other metal. There is a large percentage of copper, which makes it exceedingly tough. It is particularly adapted for use in connection with babbitting street car journals, elevator bearings, and where there is heavy pressure.

Great care is exercised in fluxing the ingredients at the proper heat so as to withstand the strain put upon it, and the metal will not flake or crush out, as do the metals composed of more lead and less copper and tin. **Price, 25 cents per pound.**

## **OLD HICKORY METAL.**

As the name signifies, a hard, tough metal for the every day work, such as shaft hangers, pillow blocks, journal boxes, etc. **Price, 15 cts per pound.**

## MAGNOLIA ANTI-FRICTION METAL.



One grade, one quality only.



**The Only** anti-friction babbitt metal that is used all over the world, by the largest Railroads, Steamships, Machinists & Manufacturers & by  
**TWELVE LEADING GOVERNMENTS.**  
**Cheaper** and better than "Genuine" Babbitt, wears longer, with less friction; will not cut journals; saves oil, fuel, power & rebabbitting.

## DEFENDER ANTI-FRICTION METAL.

One grade, One quality only.



This is not "the same as Magnolia Metal," but next to Magnolia Metal, it is warranted to be the best high grade anti-friction babbitt metal on the market, and possesses many of the excellent characteristics that have made **Magnolia Metal** world famous.

## MYSTIC ANTI-FRICTION METAL.

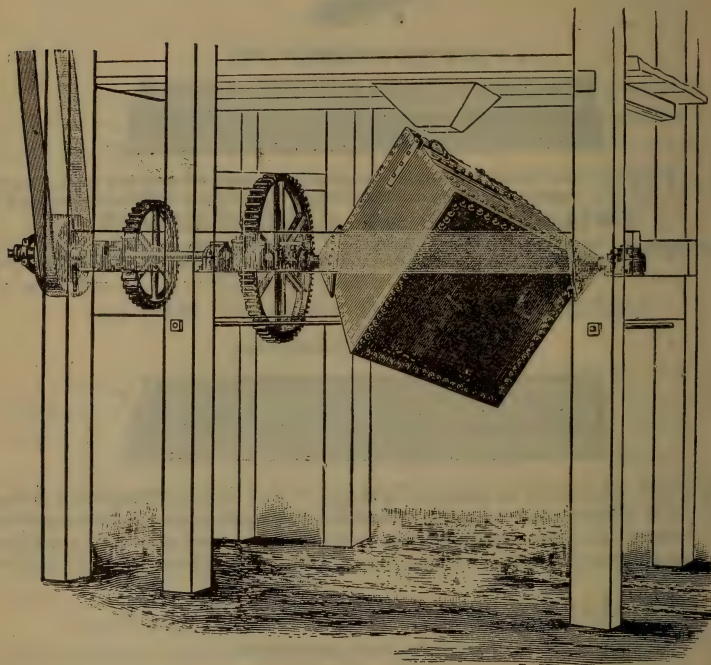
One grade, one quality only.



This is one of the best medium grade metals on the market. It is made of carefully selected and refined virgin materials and will show less dross and give better satisfaction than many babbitt metals sold at double the price.

**IMPROVED CUBE-CONCRETE MIXER.**

FOR MASONS AND BRIDGE BUILDERS, FOR USE IN CONSTRUCTING  
LOCKS AND DAMS, CONCRETE PAVEMENTS, ETC.



Without exception, this is the most thorough concrete mixing machine in use. It is largely used on Government work. The cube proper is made of steel plate; the main shaft is of large diameter and runs through the mixer at diagonal corners with two journals. The machines are now double geared, giving a slow speed with minimum driving power. It can be stopped at



any position by the friction driving pulley. A simple brake is sometimes used against this pulley. On the Government Break-water at Buffalo, N. Y., the average mix with a four-foot machine was twenty-two batches per hour, the mixer requiring from nine to fifteen revolutions per batch of about one and one-half minutes; the ordinary batch or charge was one barrel of cement, five cubic feet of sand, fifteen cubic feet of gravel and fifteen cubic feet of stone, making one cubic yard of concrete when rammed in place.

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*Extract from Report of U. S. Chief of Engineers, 1891.*

*Page 3335.*

"A 7 x 12 engine, running 245 revolutions, will run three of the four foot cubic mixers at a speed of nine revolutions per minute. Thirty-two cubic feet is the total amount charged, and fifteen revolutions will thoroughly mix it, requiring one and one-half minutes. Average work of a mixer is seventeen charges, or thirteen cubic yards per hour, and can be increased to twenty charges if material be freely supplied."

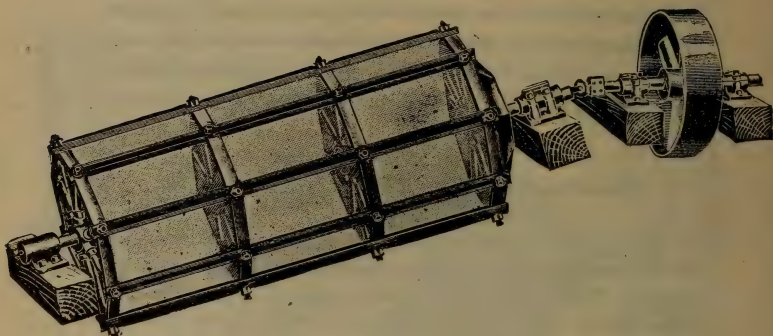
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The five foot cube machine in use on lock and dam No. 11, Kanawha River Improvement, mixed one hundred batches of concrete in ten hours, the charge consisting of two barrels of cement, sixteen feet of sand and thirty-three feet of stone, five turns making a thorough mix.

Price of 4 foot Cube Mixer, as above, without	
wood framing,                    -       -       -	\$425 00
5 foot machine, as above,       -       -       -	475 00

We are prepared to furnish these machines with worm driving gearing, accurately cut, encased and running in oil, with thrust bearings, at an advanced price over the list.

**Concrete Tubs, Boxes and Stone Scales.**

**REVOLVING SCREEN.**

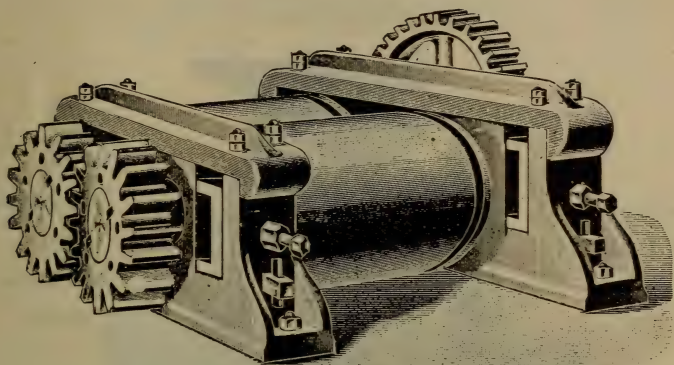
Our Revolving Screens can be placed on an angle so that they will not clog. These screens are made so that any section can easily be removed for cleaning or repairing the cloth or plates. The panels are well supported with center spiders. They are light and strong. Our universal coupling requires little care and gives good satisfaction. A thrust bearing is provided for the lower end of shaft.

When writing for prices state size and mesh of cloth or perforated steel plates required, and also kind and condition of material to be screened.

Screens may be driven by bevel gearing placed directly on the screen shaft.

Breakers for corroded lead and other purposes.

Stationary Hand Screens for coal and sand.

**CRUSHING ROLLS.**

For preparing fire clay for foundries and furnaces, for clay and other soft plastic materials.

This machine has very large bearings, which are adjustable for wear.

The gearing is large and well proportioned, and machine is very heavy and substantially constructed throughout.

The cut shows a machine with rolls 20 inches in diameter and 24 inches long.

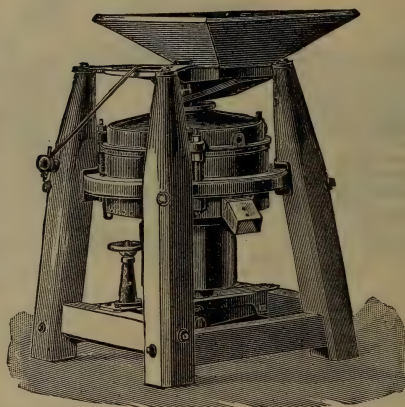
The grooves shown in rolls prevent the ground material from getting into bearings of gearing.

# PORTABLE FRENCH BUHR CORN MILL.

FOR GRINDING TABLE MEAL OR FEED.

FROM 1844.

LEADER  
FOR OVER  
FIFTY-SIX  
YEARS.



STANDARD  
OF  
COMPAR-  
ISON.

EIGHT SIZES, 15 INCH TO 36 INCH.

## “QUEEN OF THE SOUTH.”

Adopted January 1, 1901.

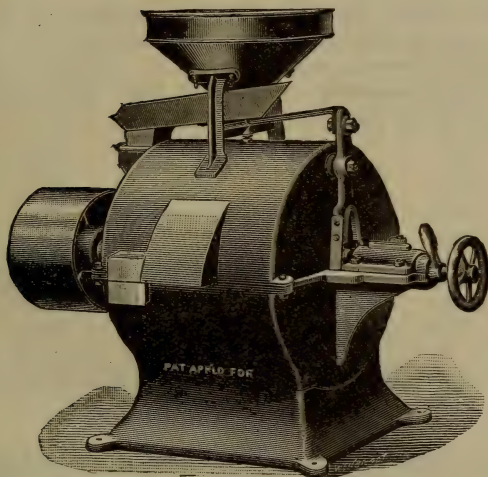
Size of Mill in inches.	Power Required.	Capacity per Hour in Bushels.	Weight.		Pulley Mill.	Geared Mill, Iron Wheel.	Geared Mill, Mortise Wheel.
			Pulley.	Geared.			
15	2 H. P.	4 to 8	725	875	\$160 00	\$225 00	\$250 00
18	4 H. P.	10 to 12	800	950	180 00	240 00	270 00
22	6 H. P.	12 to 15	1050	1350	220 00	290 00	320 00
24	7 H. P.	14 to 18	1150	1450	250 00	330 00	360 00
26	8 H. P.	15 to 20	1250	1600	280 00	350 00	390 00
28	9 H. P.	18 to 22	1400	1700	310 00	380 00	420 00
30	10 H. P.	20 to 25	1500	1800	350 00	440 00	470 00
36	12 H. P.	25 to 30	2200	2500	450 00	540 00	570 00



# VERTICAL FRENCH BUHR CORN MILL.

BUHRS FULL DIAMETER.  
ADJUSTABLE BED STONES.

LATEST IMPROVED.



THREE SIZES, 15 INCH TO 24 INCH.

“EXPORT.”

January 1, 1901.

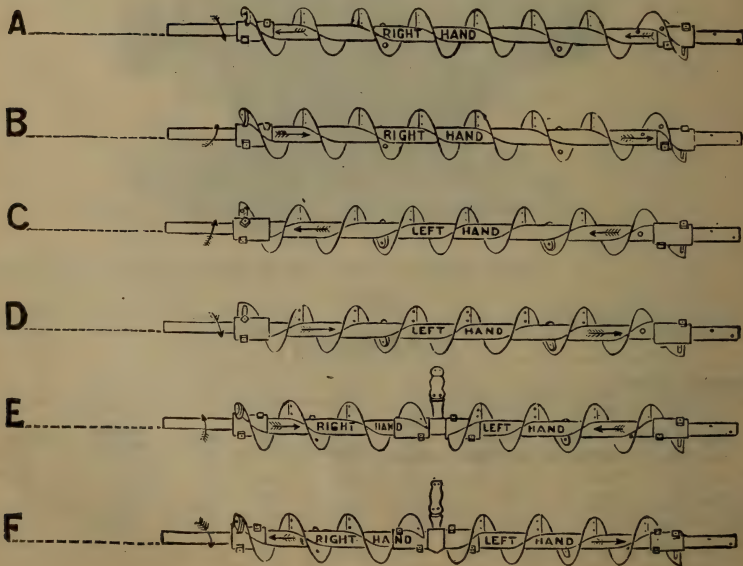
Size of Mill.	Horse Power Required.	Capacity Bushels per Hour.	Speed per Minute.	Floor Space.	Height, Inches.	Pulley.	Shipping Weight.	Price.
No. 15—15 in.	2 to 5	8 to 15	1000	42x25	37	10x6½	600 lbs.	\$165 00
No. 18—18 in.	6 to 10	15 to 30	1000	46x28	40	12x7½	900 lbs.	200 00
No. 24—24 in.	8 to 12	20 to 50	800	56x38	54	16x10	1800 lbs.	320 00

## Spiral Steel Conveyors.



We have been manufacturing Spiral Conveyors for more than twenty years and our plant is equipped with the best of machinery for this class of work. Our conveyors are furnished with either our **patent T bolt coupling** or **standard four bolt coupling**, cuts of which are shown herewith.

## Spiral Conveyors.



## Price List of Spiral Steel Conveyor.

Including Connecting Journals, Hangers and Curved Iron Lining for Box.

Outside Diameter in inches.	Price per foot.	Standard Length.	Inside Diam of Hollow Shaft.	Regular Diameter of Projections.	Maximum Capacity per hour, bushels.	Recom'd Revolut's per min.
3 in.	\$1.00	8 ft.	13-16 in.	13-16 in.	60	250
4 "	1.00	8 "	1 "	1 "	100	220
5 "	1.67	10 "	1½ "	1½ "	200	210
6 "	1.67	10 "	1½ "	1½ "	350	200
8 "	2.00	10 "	1½ "	1½ "	780	180
9 "	2.00	10 "	1½ "	1½ "	1100	175
10 "	2.80	10 "	1½ "	1½ "	1400	160
12 "	2.80	12 "	2 "	2 "	2000	150
14 "	3.75	12 "	2 "	2 "	3400	140
16 "	3.75	12 "	2 "	2 "	5000	130
16 "	5.08	12 "	3 "	2 15-16 "	5000	130
18 "	6 15	12 "	3 "	2 15-16 "	6000	130

## Price List of Galvanized Steel Conveyor.

3 in.	4 in.	5 in.	6 in.	8 in.	9 in.	10 in.	12 in.	14 in.	16 in. on 2 in.	16 in. on 3 in.	18 in.
\$1.28	\$1.28	\$2.03	\$2.03	\$2.68	\$2.68	\$3.48	\$3.48	\$4.83	\$4.83	\$6.38	\$7.79

In all other respects, information given in table above applies to Galvanized Conveyor

An extra charge is always made for driving ends including the part going into pipe We carry a large stock of standard sizes and lengths made up thereby insuring to our customers prompt shipments.

Standard lengths as listed above include the width of one hanger bearing.

Can furnish any length desired

## Extra Heavy Steel Conveyor.

For Handling Coal, Ores, etc.

We manufacture a Conveyor for coal, ores, etc., making the flights of steel from  $\frac{1}{8}$  to  $\frac{1}{4}$ -inch thick. Our improvements in coupling collar and shaft are of special advantage for this class of work.

### PRICE LIST OF HEAVY STEEL CONVEYORS.

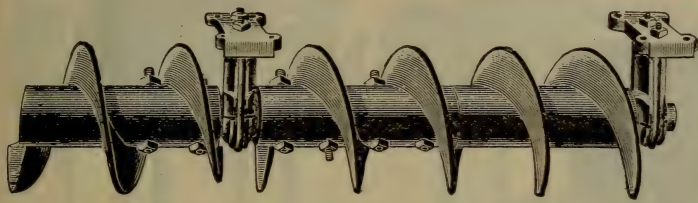
Diameter, Inches.	Standard Length Feet.	Thickness of Steel Flights in inches.	Inside Diam. of Hollow Shaft, inches.	Price per foot.
4	8	$\frac{1}{8}$	1	\$1.50
4	8	$\frac{1}{4}$	1	2.50
6	10	$\frac{1}{8}$	1 $\frac{1}{2}$	2.35
6	10	3-16	1 $\frac{1}{2}$	2.75
6	10	$\frac{1}{4}$	1 $\frac{1}{2}$	3.00
9	10	$\frac{1}{8}$	1 $\frac{1}{4}$	3.00
9	10	$\frac{1}{8}$	2	3.65
9	10	3-16	1 $\frac{1}{2}$	3.90
9	10	3-16	2	4.40
9	10	$\frac{1}{4}$	1 $\frac{1}{2}$	4.40
9	10	$\frac{1}{4}$	2	4.90
9	10	$\frac{3}{8}$	2	6.20
12	12	3-16	2	4.80
12	12	3-16	3	5.65
12	12	$\frac{1}{4}$	2	5.70
12	12	$\frac{1}{4}$	3	6.55
12	12	$\frac{3}{8}$	3	9.00
16	12	3-16	3	7.50
16	12	$\frac{1}{4}$	3	8.50
18	12	5-16	3	12.50
18	12	$\frac{1}{2}$	3	20.00

LESS DISCOUNT.

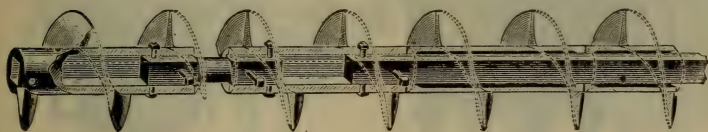
Above price includes journals and hangers, **but no Lining.** It is also for regular thickness of hollow shaft. When wanted on extra heavy hollow shaft or solid shaft, we quote upon application special prices.



## Cast Iron Conveyor.



We manufacture Cast Iron Conveyors, put up on square steel shaft, with journals and couplings, turned for receiving bearings and hangers. We put up these conveyors in all diameters from 9-in. to 18-in. on shafts from 2-in. square to  $3\frac{1}{2}$ -in. square. We have furnished a great deal of this conveyor for cement plants, fertilizer works, etc. Prices and full information given on application.

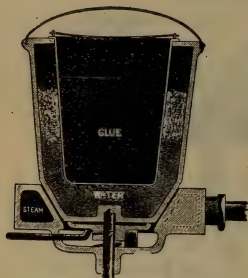


### Method of Coupling Cast Iron Conveyor.

The above cut shows our method of coupling cast iron conveyor. Please note that the bolts can be taken out and the coupling slipped back into the end segment of the conveyor so that a section of conveyor may be removed and repaired without disturbing the whole line. We have found this a very satisfactory method of coupling this style of conveyor,

## GLUE HEATERS AND BOILERS.

## Contact Heaters.



## SECTIONAL VIEW.

Showing glue pot and jacket in position, but not in contact with heater ring. Regulating lever is shown at left.

No. 1 has No. 4 half gallon pot.

No. 2 has No. 23 one gallon pot.

Weight No. 1, 25 lbs., No. 2, 40 lbs.

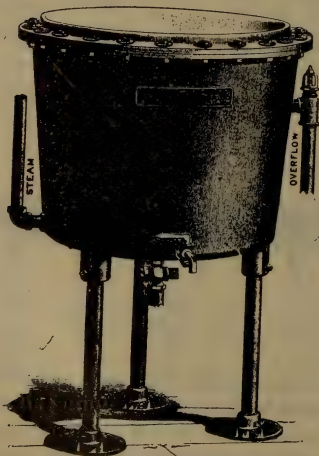


## No. 6 1/2 HEATER.

SHIPPING WEIGHT, 110 LBS.

Capacity, two gallons. Inside pot heavily coated and removable.

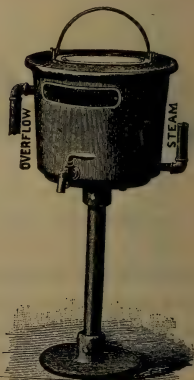
Size of steam pipe, 3/4 inch; overflow, 1/4 inch.



## No. 7 1/2 STEAM GLUE BOILER.

CAPACITY, 35 GALLONS. WEIGHT, 700 LBS.

Heavily coated inside pot prevents contents from being discolored or adhering to sides. Brass safety valve attached to overflow pipe to prevent extra pressure in the tank. 1 1/4-inch brass valve at bottom for draining off glue. Brass bib in front for draining water from tank. Size of steam pipe, 3/4 inch; overflow, 1 1/4 inch.

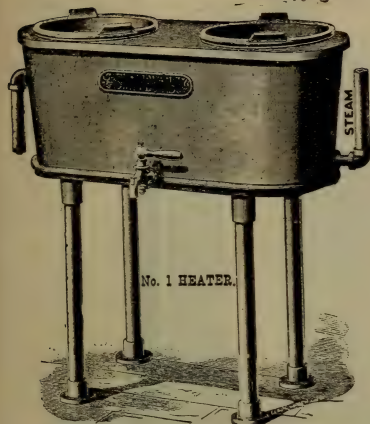


## No. 10. GLUE HEATER

Capacity, 1/2-gallon. Inside Pot Enamelled and Removable.

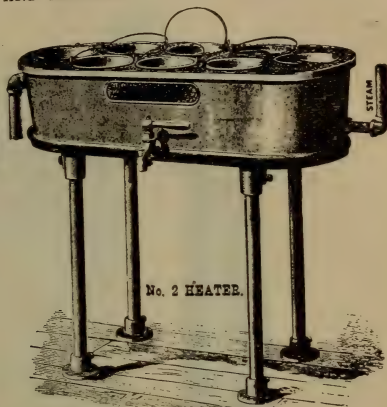
Size Steam Pipe, 3/8-inch; Overflow Pipe, 1/4-inch. Furnished with or without Stand, as desired. Shipping weight, 110 pounds.

## GLUE HEATERS AND BOILERS



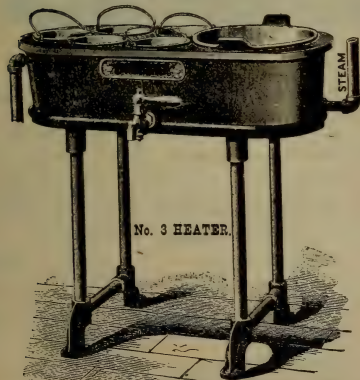
No. 1 HEATER.

With two Enameled Pots, 3 gallons each.  
Shipping weight, 175 pounds.



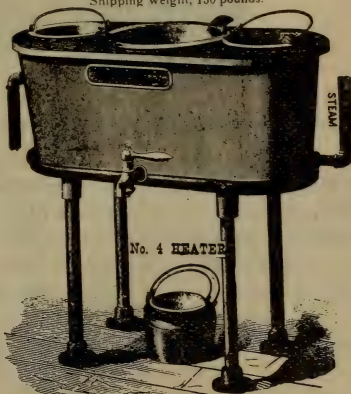
No. 2 HEATER.

With 8 Enameled Pots,  $\frac{1}{4}$  gallon each.  
Shipping weight, 150 pounds.



No. 3 HEATER.

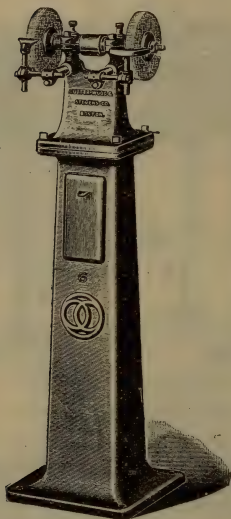
With 5 Enameled Pots,  $\frac{1}{4}$  gallon each, and one  $1\frac{1}{2}$  gallon Pot.  
Shipping weight, 150 pounds.



No. 4 HEATER.

With 2 enameled Pots,  $\frac{1}{4}$  gallon each, or two Bench Pot  
1 quart each, with outside Jackets, shown below Heater,  
and one 3 gallon Pot. Shipping weight, 175 pounds.

## 6 INCH GRINDER.



## 8 INCH GRINDER.



## For Two Wheels 6 in. Diameter.

Arbor.....	$\frac{1}{2}$ in. diameter 12 $\frac{1}{2}$ in. long
Bearings (reamed) .....	2 $\frac{1}{2}$ in. x $\frac{5}{8}$ in.
Pulley.....	2 in. x 1 $\frac{3}{4}$ in.
Height to center of Arbor.....	38 "
" of Pedestal.....	30 "
Price of Head.....	\$10.00
" of Pedestal.....	7.00
" of Countershaft.....	7.00

## For Two Wheels 8 in. Diameter.

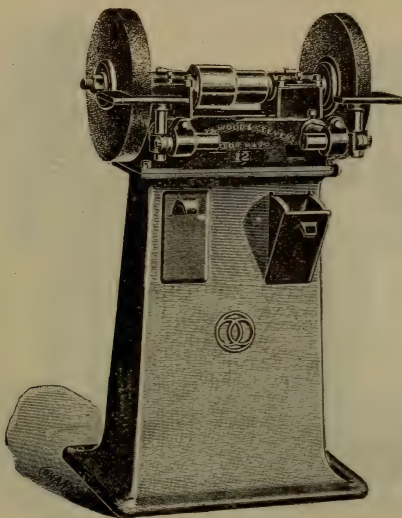
Arbor.....	$\frac{3}{8}$ in. diameter 16 in. long
Bearings (reamed) .....	3 in. x $\frac{3}{4}$ in.
Pulley.....	2 $\frac{1}{2}$ in. x 2 $\frac{1}{4}$ in.
Height to center of Arbor.....	37 $\frac{1}{2}$ "
" of Pedestal.....	30 "
Price of Head.....	\$12.00
" of Pedestal.....	8.00
" of Countershaft.....	12.00

PRICE DOES NOT INCLUDE EMERY WHEELS.



## 10 INCH GRINDER

## 12 INCH GRINDER



12 Inch Grinder.

**For Two Wheels 10 in. Diameter.**

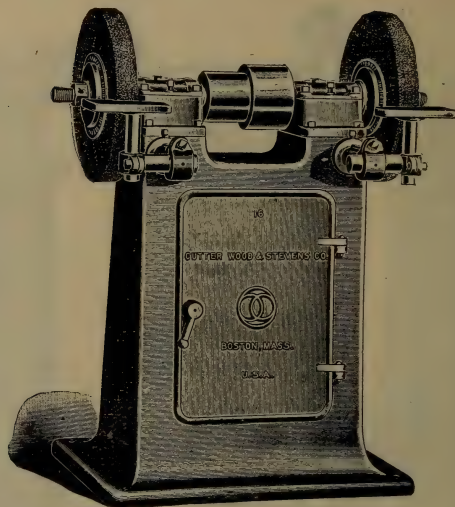
Arbor.....	$\frac{3}{4}$ in. diameter 23 in. long
Bearings, self-oiling.....	4 in. x $\frac{7}{8}$ in.
Cone Pulley $3\frac{1}{2}$ and $2\frac{1}{2}$ in. diam. x 3 in.	
Height to center of Arbor.....	37 in.
“ of Pedestal.....	$30\frac{1}{2}$ “
Weight of Head.....	60 lbs.
“ “ Pedestal.....	140 “
Price of Head.....	\$18 00
“ “ Pedestal.....	12 00
“ “ Self-oiling Countershaft..	14 00

**For Two Wheels 12 in. Diameter.**

Arbor.....	1 in. diameter 31 in. long
Bearings, self-oiling.....	5 in. x $1\frac{1}{8}$ in.
Cone Pulley 4 and 3 in. diam. x $3\frac{1}{2}$ in. face	
Height to center of Arbor.....	38 in.
“ of Pedestal.....	$30\frac{1}{2}$ in.
Weight of Head.....	110 lbs.
“ “ Pedestal.....	250 “
Price of Head.....	\$26 00
“ “ Pedestal.....	18 00
“ “ Self-oiling Countershaft.	20 00

PRICE DOES NOT INCLUDE EMERY WHEELS.

## 16 INCH GRINDER.



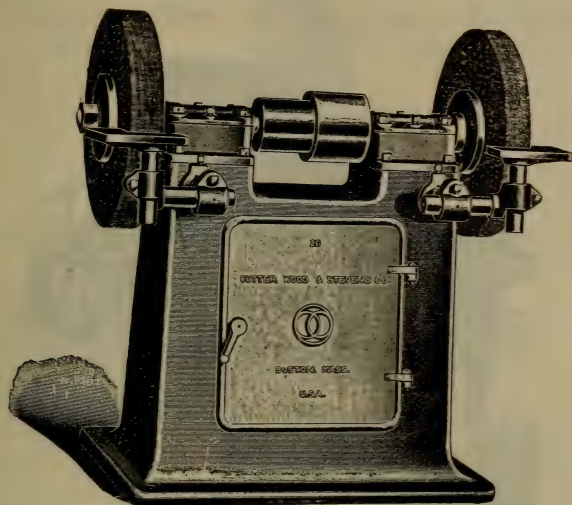
For Two Wheels 16 in. Diameter.

A substantial machine, with self-oiling bearings.

Distance between Wheels.....	25 in.
Arbor.....	1¼ in. diameter 40 in. long
Bearings.....	7 in. x 1½ in.
Cone Pulley.....	.6 in. and 4½ in. diameter x 4 in. face
Height to center of Arbor.....	.36 in.
Weight.....	475 lbs.
Price of Guide.....	\$65 00
“ “ Self-oiling Countershaft.....	24 00

PRICE DOES NOT INCLUDE EMERY WHEELS.

## 20 INCH GRINDER.



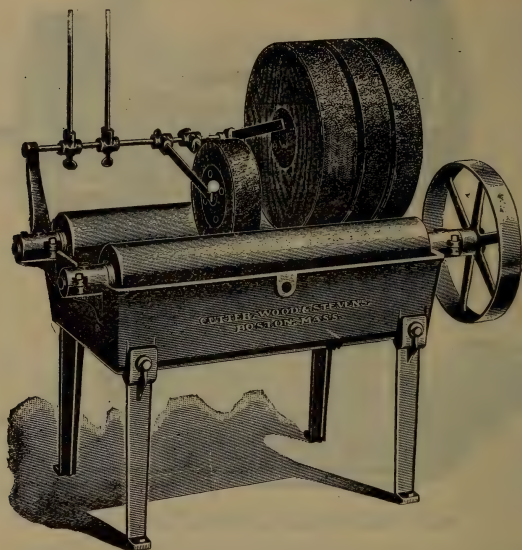
For Two Wheels 20 in. Diameter.

A heavy substantial machine, with self-oiling bearings.

Distance between wheels.....	32½ in.
Arbor .....	1½ in. diameter, 48 in. long
Bearings .....	9 in. x 1⅝ in.
Cone Pulley .....	7 in. and 5 in. diameter x 5 in. face
Height to centre of Arbor.....	33 in.
Weight .....	650 lbs.
Price of Grinder.....	\$80 00
Price of Self-oiling Countershaft .....	27 00

PRICE DOES NOT INCLUDE EMERY WHEELS.

## WOOD WHEEL CLEANING MACHINE.



This machine has iron sink instead of the old style wooden sink and can be used with hot water when desired. It may be connected with feed water pipe on front and with waste pipe through bottom. Plenty of water is recommended so as to carry off the old glue and prevent odor due to accumulations usually noticed when water is not frequently renewed.

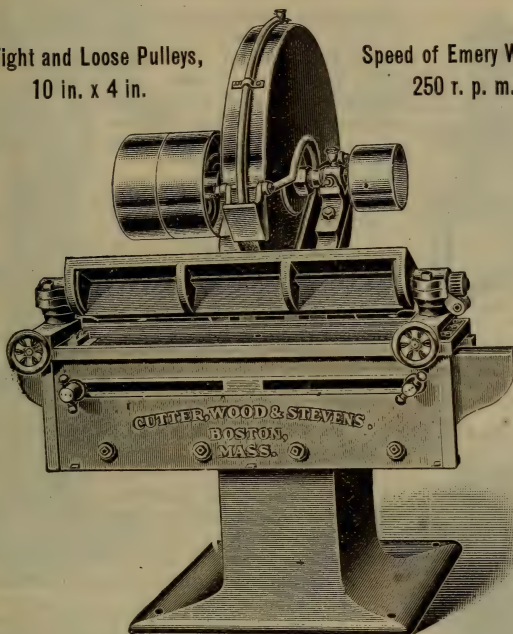
Driving Pulley .....	12 in. x 2 in., speed 50 r. p. m.	
No. O Machine, 24 rolls .....		\$28 00
No. 1      "      36      " .....		33 00



## AUTOMATIC KNIFE GRINDING MACHINE.

Tight and Loose Pulleys,  
10 in. x 4 in.

Speed of Emery Wheel,  
250 r. p. m.



**For all Straight Knives, Cutters, Shears, etc.**

This machine is simple, durable, well made and guaranteed to do the work.

The cut shows machine equipped with water attachment. No pump is used, but water is to be supplied to pipe at top of machine; and catch basin in base of machine is to be connected with waste pipe.

## Price List.

## DRY MACHINE.

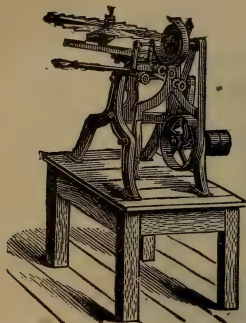
## WET MACHINE.

For 24 in. Knives.....	\$125 00
" 30 " " .....	135 00
" 36 " " .....	145 00
" 42 " " .....	155 00
" 50 " " .....	165 00
" 60 " " .....	215 00
" 80 " " .....	250 00

For 24 in. Knives.....	\$165 00
" 30 " " .....	175 00
" 36 " " .....	190 00
" 42 " " .....	200 00
" 50 " " .....	215 00
" 60 " " .....	270 00
" 80 " " .....	320 00

## Buffalo Saw Sharpener

(PATENTED IN UNITED STATES, CANADA AND ENGLAND.)



These are handy machines especially adapted for rip and cross-cut circular saws, from 6 to 40 inches in diameter. They not only sharpen the teeth perfectly in less than one-third the time required by hand filing, but keep them gummed and uniform in size and shape. No files are needed where the Buffalo Saw Filer is used, except for very fine teeth.

### No. 1 AUTOMATIC

FOR SAWS 6 TO 40 INCHES DIAMETER

NET PRICES F. O. B. BUFFALO

No. 1.—Automatic, as shown above with 3 emery wheels, wrenches, table, etc..... \$65 00  
Same, without Automatic attachment..... 50.00

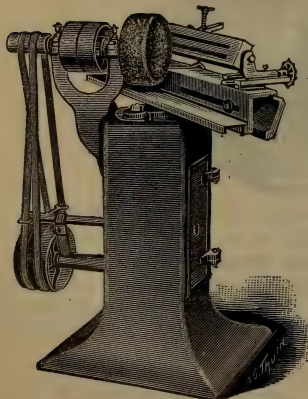
*Circular Cross-Cut Saws can be sharpened on this machine, but not automatically.*

Send for small catalogue of full line of sizes and styles.

## Buffalo Knife Grinder

*Automatic.*

*Patented in the U. S., Oct. 31, 1893.*



These Knife Grinders are not as heavy as some machines on the market of the same capacity, but they are strong and heavy where strength and weight are necessary.

Machines require little attention after the knife is bolted on.

The carriage has an even traverse back and forth, and reversing is accomplished without noise or jar.

### STYLE A

#### WEIGHTS AND PRICES OF MACHINES

To Grind Knives to 26 inches,	500 lbs.	\$ 75.00
" " " " 32 "	550 "	85 00
" " " " 38 "	600 "	90 00
" " " " 44 "	650 "	100.00
" " " " 54 "	750 "	115.00
" " " " 60 "	800 "	125.00

Style B is the same machine as style A with a pump, tank and other attachments added for the use of water.

Add 50 lbs; to weight and \$10.00 to price for these attachments.

Send for small catalogue of full line of sizes and styles.

## THE WORCESTER DRILL GRINDERS.

### No. 0, Style C

(Universal)

Grinds Drills from  $\frac{1}{8}$  inch to 2 $\frac{1}{2}$  inches in diameter ❀ ❀ ❀ ❀

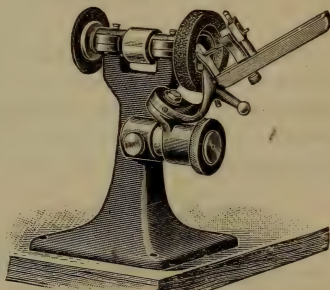
Never before has a DRILL-GRINDER been placed on the market capable of properly grinding such a variety of Drills, also capable of giving all of them any desired clearance at a single setting of the machine, irrespective of their diameters; and last but not least, capable of giving the point of any drill any angle ranging from 140 degrees to 75 degrees, or from 22 degrees above the standard and down to 43 degrees below.

The NEW UNIVERSAL GRINDER not only does all this, but possesses all the good features which have given the WORCESTER DRILL GRINDERS their reputation and made them the standard machines of their class the world over.

**MADE IN FIVE STYLES.**

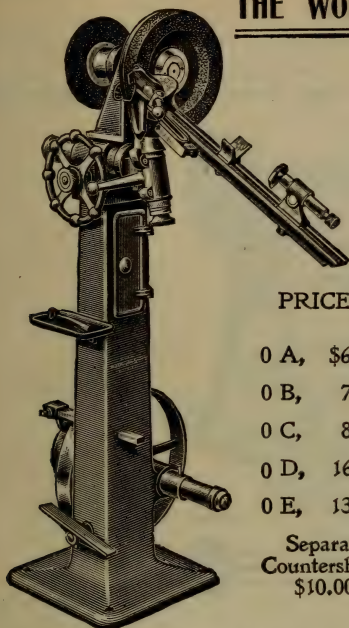
### No. 3, Style A

(Bench Machine)



No. 3, Style A, \$40.00.

Separate Countershaft, \$8.00.



#### PRICES:

0 A, \$65.00

0 B, 70.00

0 C, 80.00

0 D, 160.00

0 E, 138.00

Separate  
Countershaft,  
\$10.00

#### A Handy, Common-sense Drill Grinder.

Will correctly grind drills varying from  $\frac{1}{8}$  inch in diameter down to little drills with cutting-lips too small for the eye to see unaided.

Accuracy, Handiness and Simplicity are  
its strong points.

Grinds the smaller drills just as correctly as the larger ones, giving each cutting-lip exactly the right shape and length.

The amount of clearance given to the cutting edge of the lip can be changed at will.

Those drills which are too small to handle conveniently are held in place automatically.

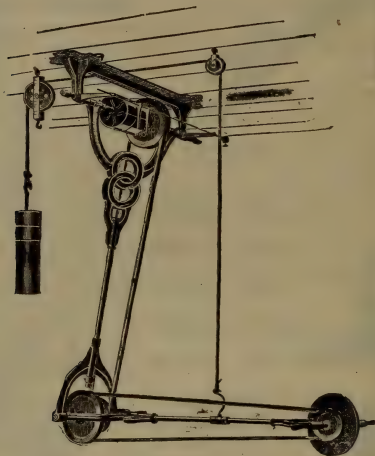
This little machine also has our fine micrometer feed.

We carry 25 varieties of Twist Drill Grinders, for Wet and Dry Grinding. Our machines will grind twist drills from  $\frac{3}{16}$  inches in diameter down to a No. 70.

Every Machine is Fully Guaranteed.

Send for full description and price,

## SWING FRAME GRINDING AND POLISHING MACHINE



This machine is in use in many large iron works where the work to be ground, polished or brushed is too heavy to be brought to the emery wheel or brush. The operator may raise, lower or swivel the wheel to any desired position, thereby covering a large range of surface before adjusting the work to a new position. All bearings are babbitted and the belts are of V shape, endless and noiseless.

### Heavy Machine.

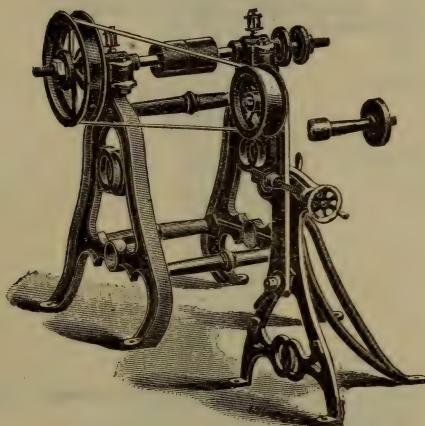
Weight..... 475 lbs.  
 Takes wheels to 14 in. dim. x 2½ in. face  
 T and L Pulleys 8 " " x 4 " "  
 Speed of Centershaft..... 390 r.p.m.  
 Price..... \$125 00

### Light Machine.

Weight... 325 lbs.  
 Takes wheels to 12 in. dim. x 2 in. face  
 T and L Pulleys 8 " " x 3 " "  
 Speed of Centershaft..... 440 r.p.m.  
 Price..... \$110 00



# WOOD WHEEL POLISHING MACHINE AND No. 1 BELT POLISHING ATTACHMENT.



Total length of Arbor.....	42 in.
Arbor between flanges.....	1 $\frac{1}{4}$ in.
Bearings.....	6 in. by 1 $\frac{3}{8}$ in.
Height to centre of arbor.....	30 in.
Pulley (single sent unless otherwise ordered).....	5 in. by 4 in.
Weight.....	300 lbs.
Price of Polishing Machine.....	\$50 00
“ “ Countershaft.....	23 00

## No. 1 BELT POLISHING ATTACHMENT.

For Belts 1 $\frac{1}{2}$ in. wide.....	\$23 00
“ “ 2 “ “.....	25 00
“ “ 3 “ “.....	27 00

## No. 00 POLISHING AND BUFFING HEAD.



Distance between buff wheels.....	18 in.
Arbor between flanges.....	$\frac{1}{2}$ in.
Bearings.....	$2\frac{1}{2}$ in. by $\frac{7}{8}$ in.
Height to centre of arbor.....	8 in.
Pulley.....	2 in. by 2 in.
Weight.....	21 lbs.
Price.....	\$10 00

## No. 0 POLISHING AND BUFFING HEAD.



Distance between buff wheels.....	24 in.
Arbor between flanges.....	$\frac{1}{2}$ in.
Bearings.....	$3\frac{1}{4}$ in. by $1\frac{1}{16}$ in.
Height to centre of arbor.....	9 in.
Pulley.....	$2\frac{1}{2}$ in. by 2 in.
Weight.....	35 lbs.
Price.....	\$15 00

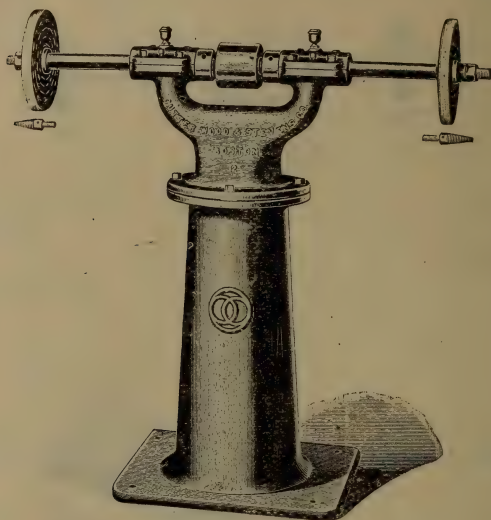
## No. 1 POLISHING AND BUFFING HEAD ON PEDESTAL.



Recommended for 8 in. or 9 in. buffs at 3000 to 3300 revolutions per minute;  
for light buffing.

Total length of Arbor.....	36 in.
Arbor between Flanges.....	$\frac{3}{4}$ in.
Bearings (babbitted).....	5 in. by $1\frac{1}{4}$ in.
Height of Head.....	10 in.
“ “ Pedestal .....	28 in.
Pulley .....	$3\frac{1}{2}$ in. by $3\frac{1}{4}$ in.
Weight of Head.....	70 lbs.
“ “ Pedestal.....	125 lbs.
Price of Head.....	\$22 00
“ “ Pedestal.....	10 00
“ “ Countershaft (Self-oiling).....	12 50

## No. 2 POLISHING AND BUFFING HEAD ON PEDESTAL.

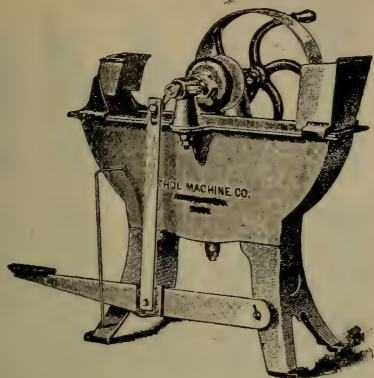


Recommended for 9 or 10 in. buffs at 2800 to 3000 revolutions per minute.  
For general light and medium buffing.

Total length of Arbor.....	44 in.
Arbor between flanges.....	1 in.
Bearings (babbitted).....	6 in. x 1½ in.
Height of Head .....	11 in.
“ “ Pedestal.....	27 in.
Pulley .....	4 in. x 3¾ in.
Weight of Head.....	110 lbs.
“ “ Pedestal .....	135 lbs.
Price of Head.....	\$30 00
“ “ Pedestal .....	14 00
“ “ Countershaft (Self-oiling).....	20 00



## GRINDSTONE FRAMES.



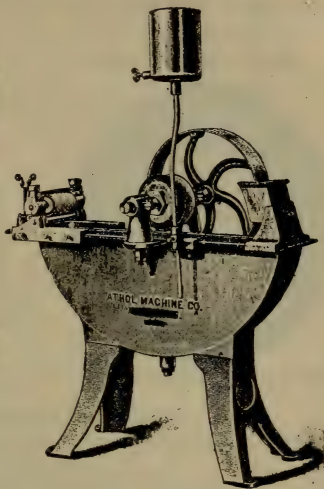
With water guard and adjustable tool rest.

Takes stone 30" in diameter and 4" face

Without Pulley or Treadle Attachment \$12.00

Pulley, extra \$1.50 Treadle \$1.50

Pulley has removable handle attached, as shown in cut.

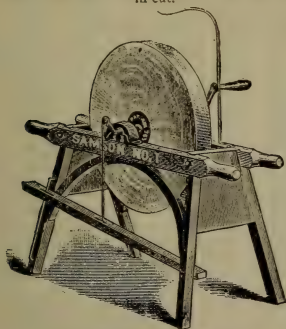


With adjustable tool rest, truing attachment and water pot.

Takes stone 30" in diameter and 4" face.

Price, Complete, without stone, \$18.00

Without water pot 17 00



PRICES INCLUDE STONE.

The Samson Wood Frame.

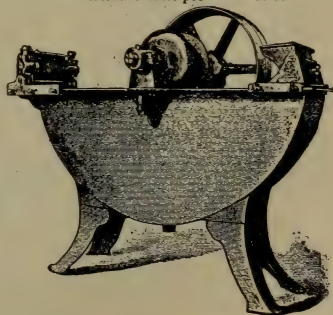
With Stone.

No.		Each.
3	18 x 13 1/4 to 2 1/4 in. weight, 40 to 50 lbs.....	5.00
2	20 or 22 x 13 1/4 to 2 1/4 in. weight, 70 to 80 lbs.	6.00
1.	24 x 13 1/4 to 2 1/4 in. weight, 100 to 110 lbs.	7.00

With adjustable tool rest, and truing attachment.

Takes stone 42" diameter, 8" face.

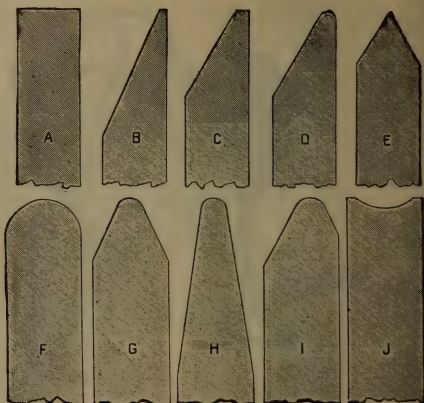
Price complete without stone \$50.00



## EMERY WHEELS

SHAPES OF  
REGULAR WHEELS.

Special Shapes Furnished.



## PRICE LIST OF REGULAR SOLID WHEELS.

Diam. in Inches.	THICKNESS OF WHEELS IN INCHES.																		
	¼	⅜	½	⅝	¾	1	1¼	1½	1¾	2	2¼	2½	2¾	3	3¼	3½	4		
1	.25	.30	.30	.35	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	1.00		
1½	.30	.35	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10		
2	.35	.45	.50	.55	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.05	1.10	1.20		
2½	.40	.55	.65	.70	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	2.05		
3	.50	.65	.80	.90	.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60	2.90		
3½	.60	.80	.95	1.05	1.05	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.15	3.35	3.75		
4	.75	.95	1.10	1.25	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10	4.60		
4½	.90	1.10	1.25	1.40	1.55	1.85	2.15	2.45	2.75	3.05	3.35	3.65	3.95	4.25	4.55	4.85	5.45		
5	1.00	1.20	1.40	1.60	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	7.00		
6	1.40	1.60	1.75	2.10	2.40	3.05	3.70	4.35	5.00	5.65	6.30	6.95	7.60	8.25	8.90	9.55	10.85		
7	1.85	2.00	2.15	2.60	3.00	3.85	4.70	5.55	6.40	7.25	8.10	8.95	9.80	10.65	11.50	12.35	14.05		
8	2.10	2.35	2.60	3.10	3.60	4.60	5.60	6.60	7.60	8.60	9.60	10.60	11.60	12.60	13.60	14.60	16.60		
9	2.50	2.80	3.10	3.70	4.25	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	15.75	16.90	19.20		
10	3.00	3.35	3.65	4.35	5.00	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	18.50	19.85	22.55		
12	3.60	3.80	4.00	5.00	6.00	7.40	9.00	10.70	12.75	14.00	15.70	17.40	19.00	20.75	22.50	24.25	27.50		
14	4.05	5.15	6.25	7.35	8.45	10.65	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	30.45	32.65	37.05		
16	.....	.....	.....	.....	10.85	13.70	16.55	19.40	22.25	25.00	27.95	30.80	33.65	36.50	39.35	42.20	47.90		
18	.....	.....	.....	.....	13.25	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	50.75	54.50	62.00		
20	.....	.....	.....	.....	20.25	24.75	29.25	33.75	38.25	42.75	47.25	51.75	56.25	60.75	65.25	74.25			
22	.....	.....	.....	.....	25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	79.00	85.00	97.00			
24	.....	.....	.....	.....	29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00	85.00	92.00	99.00	113.00			
26	.....	.....	.....	.....	.....	45.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	107.00	115.00	131.00			
30	.....	.....	.....	.....	.....	61.00	72.00	83.00	94.00	105.00	116.00	127.00	138.00	149.00	171.00				
36	.....	.....	.....	.....	.....	95.00	110.50	126.00	141.50	157.00	172.50	188.00	203.50	219.00	250.00				

In ordering, state the following particulars:

The diameter, thickness, shape of face, diameter of hole, and the grade, also the kind of work you wish to do with the wheel.

Subsequent orders can be filled by referring to the previous transaction, as full record is kept of all wheels supplied.

## Price List of Emery Cylinders and Cup Wheels.

Diam. Inches.	THICKNESS OF RIM.						
	1	1½	2	2½	3	3½	4
8	15 50						
9	16 50	22 00					
10	17 75	24 25	29 50				
12	18 75	26 25	33 00	38 75	44 00		
14	22 50	31 00	38 50	45 50	51 50	57 50	61 50
16	26 00	35 75	44 60	53 00	60 25	67 60	73 00
18	28 80	40 25	51 40	61 40	71 00	79 00	86 90
20	30 90	44 00	56 25	67 40	78 50	87 60	97 00
22	35 00	49 75	65 00	79 40	91 50	103 90	115 50
24	37 50	54 25	70 50	86 25	99 50	113 60	126 60
26	39 75	59 80	77 00	93 00	109 25	124 75	139 25

Above list is figured on a basis of Cylinders 7 inches long; other lengths at proportionate rates.

To obtain the price of Cup Wheels, add the price of a regular wheel, whose diameter is the inside diameter of the cylinder, and thickness whatever is required for the back of cup wheel.

## Price List of Emery Bricks or Rub Stones.

Width or thickness of Bricks in inches.	WIDTH OR THICKNESS OF BRICKS IN INCHES.													
	4	3½	3	2½	2	1¾	1½	1¼	1	¾	⅝	½	⅜	¼
¼	30	28	27	26	24	23	22	21	20	19	18	17	16	15
⅜	34	33	31	29	27	26	25	23	22	21	20	19	17	
½	38	36	34	32	30	28	27	26	24	22	21	20		
⅝	42	39	37	35	32	31	29	27	26	23	22			
¾	50	43	40	37	34	33	31	29	27	25				
1	70	60	50	42	38	36	34	32	30					
1¼	85	75	65	53	42	39	37	35						
1½	100	90	80	65	50	43	40							
1¾	120	105	90	75	60	51								
2	135	120	100	85	70									
2½	170	150	130	110										
3	205	180	155											
3½	240	210												
4	275													

Above list is figured on a basis of bricks 4 inches long; other lengths at proportionate rates.

**\*\*Sand (Flint) Papers and Cloth.**

Prices per ream In sheets 9" x 11"

Nos	000	00, 0,	1 or 1½,	\$5 00.	
Nos.	2	2½	3	3½	4
	\$5.50	\$6.00	\$6.50	\$7.00	\$8.00

**"STAR" SAND PAPER.**

In sheets 8¼" x 10½"

All numbers (0 to 3 and ass rted), \$4.25 per ream.

\*NOTE—When ordering this paper be sure and specify "Star."

**EXTRA "FLINT" PAPER--In Rolls.**

Per roll 50 yards long.

Prices per roll.

Widths	Nos. 00 to 1½	No. 2	No. 2½	No. 3	No. 3½	No. 4
24"	\$5.50	\$6.00	\$6.50	\$7.00	\$8.00	\$9.00
30	8 00	9 00	10 00	11 00	13 00	15 00
36	10 00	11 00	12 00	13 00	15 00	
40	12 00	13 00	14 00	15 00	17 00	
42	13 00	14 00	15 00	16 00	18 00	
48	15 00	17 00	18 00	20 00	23 00	

**SAND (FLINT) CLOTH.—Per Roll.**

14" wide and 50 yards long.

Nos. 00, 0, 1, 1½ or 2, \$10.00 per roll, either No. 2½ or 3, 12 50

**GARNET PAPER.**

In sheets 9" x 11."

Nos. 00, 0, 1 or 1½, \$5.50 per ream.

Nos.	2	2½	3
Per ream,	\$6.00	\$6.50	\$7.00

In rolls 50 yards long.

Prices per roll.

Widths	Nos. 00 to 1½	No. 2	No. 2½	No. 3
24"	\$6.00	\$6.50	\$7.25	\$8.25
30	9 00	10 00	11 00	12 00
36	11 00	12 00	13 00	14 00
40	13 00	14 00	15 00	16 00
42	15 00	16 00	17 00	18 00
48	18 00	20 00	22 00	25 00

**Emery Paper and Cloth.****EMERY PAPER.—Per Ream.**

In sheets 9" x 11"

Nos.	00, 0, 1 or 1½,	\$7.00.		
Nos.	2	2½	3	3½
Per ream.	\$8.00	\$10 00	\$12 00	\$14 00

**EMERY PAPER.—Per Roll.**

24" wide and 50 yards long.

Nos. 00, 0, 1 or 1½, \$7.50.				
Nos.	2	2½	3	3½
Per roll,	\$9.00	\$11.00	\$13.00	\$15.00

**EMERY CLOTH.--Per Ream.**

In sheets 9" x 11"

Nos. FF, F, 000, 00, 0, 1 or 1½, \$20 00 per ream.

Nos.	2	2½	3	3½
Per ream,	\$22.00	\$26.00	\$28.00	\$30.00

**CROCUS CLOTH.**

\$20.00 per ream.

**EMERY CLOTH.—In Rolls.**

Per roll 50 yards long.

Prices per roll.

Widths.	Nos. 00 to 1½	2	2½	3	3½
9"	\$7 00	\$8.00	\$9.50	\$11.00	\$13.00
18	14 00	16 00	19 00	22 00	26 00
27	21 00	24 00	28 50	33 00	39 00

**EMERY PAPER.**

Each Bundle Contains

Numbers	00	0	1½	1	1½	2	2½	3	3½
Reams...	4½	4	3½	3	2½	2	1½	1½	1½
Assorted (Reams).....									2½

**EMERY CLOTH.**

Each Bundle Contains

Number	00	0	1½	1	1½	2	2½	3	3½
Reams.	2½	2½	2	1½	1½	1	¾	¾	¾
Crocus (Reams).....				2					2



**The Huntington Emery Wheel Dresser.**

IMPROVED.



FOR TRUING, SHAPING, SHARPENING, AND REMOVING GLAZE FROM SOLID EMERY WHEELS RUNNING AT FULL SPEED.

All parts of this tool are made in duplicate, and the greatest damage that may be done to it by careless or improper use can be repaired at slight cost.

Patent Emery Wheel Dresser (two sets of cutters).....\$3 00  
Extra Cutters, per set..... 50

**RUPERT'S IMPROVED DOUBLE EMERY WHEEL DRESSER.**

For cleaning, sharpening and removing the glaze from the emery wheel use the center set of cutters entirely. You require no rests on your grinder. It makes no difference which way the emery wheel runs, toward you or away from you. With the natural pressure of the arms you place the tool upon the face of the emery wheel running at any speed, work the tool gradually across the face three or four times, when you will find all foreign matters removed, and the emery wheel with a keen cutting edge upon its surface. You will note while operating it thus that you have taken but very little of the emery wheel off, NOT ONE TENTH PART AS MUCH AS YOU WOULD HAVE DONE WITH THE OLD STYLE DRESSERS, or with the set of cutters on end of tool. Thus this tool will pay for itself in the SAVING OF YOUR EMERY WHEELS ALONE. Every time the center set of cutters are used for cleaning and removing the glaze from the emery wheels, it SAVES the end set for TRUING, thus prolonging the actual life of the tool, from two to three times longer than any tool now made. Therefore, you will readily see the advantage in using

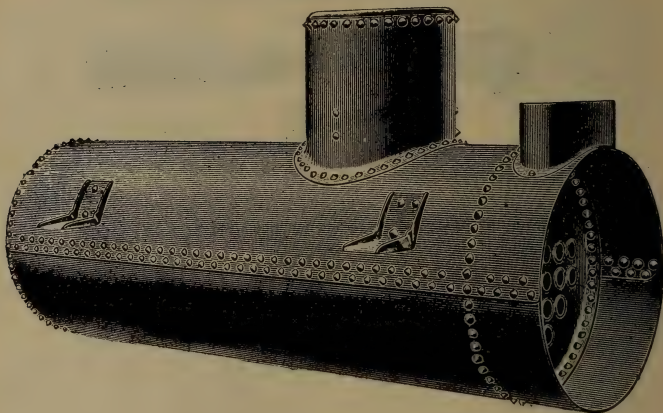
Price, \$1 50.

**Rupert's Improved Double Emery Wheel Dresser.**

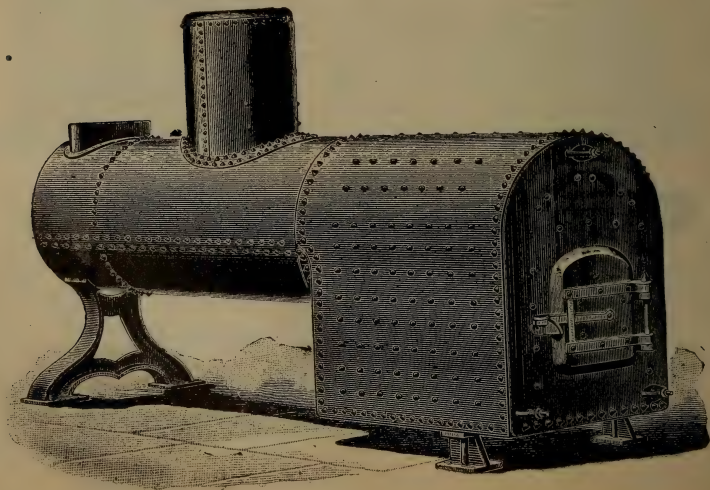
Note the points of advantage:

- 1st. Two dressers in one
- 2d. Saving of emery wheels by using the center set of cutters to remove glaze.
- 3d. By using center set of cutters for removing glaze, etc., the end set of cutters are preserved for TRUING only, making the tool wear out nearly, if not quite, three of the old style dressers that has been on the market for the last thirty years.
- 4th. The lasting qualities of Rupert's Dressers reduces the costs of emery wheel dressers 75 per cent. to the consumer
- 5th. The tool is "made for business" weighing 24 pounds, substantially made, workmanship of the very best, the original cost being very little more than the single tools now used. The old style cutters are used in this tool.

HORIZONTAL STATIONARY TUBULAR  
BOILER.



PORTABLE OR LOCOMOTIVE BOILER.



## Prices of Horizontal Tubular Boilers, with Full Flush Fronts, and 3 and 3½-inch Tubes.

Horse Power	10	15	20	25	30	35	40	45	50	60	70	80	100	110	125	150
Diameter in inches, length in feet	32x8	36x8	40x10	44x12	48x14	52x16	56x18	60x20	64x22	68x24	72x26	76x28	80x30	84x32	88x34	92x36
Number and diameter of Tubes	14-3	22-3	30-4	38-4	46-4	54-4	62-4	70-4	78-4	86-4	94-4	102-4	110-4	118-4	126-4	134-4
Boiler without Smoke Doors	\$121	\$144	\$168	\$192	\$216	\$240	\$264	\$288	\$312	\$336	\$360	\$384	\$408	\$432	\$456	\$480
Full Flush Front	38	38	38	46	46	46	54	54	54	62	62	62	70	70	70	78
Tupper Grates	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Back Wall Plate	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Foot Door and Frame	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Water Column and Gauges	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Check and Stop Valve	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Blow-Off Valve	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Whistle	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Smoke Stack and Guy Rope	24	28	30	36	39	41	48	55	55	57	68	106	120	120	130	130
Boiler, with Fixtures and Fittings	224	280	286	326	372	414	454	511	545	667	722	851	1053	1115	1241	1386
Deduct for Dome	13	14	14	18	20	24	24	29	29	36	36	46	51	51	53	53
Dry Pipe	7	9	9	9	9	12	12	12	12	14	14	17	22	22	22	22

## Prices of Horizontal Tubular Boilers, with Full Flush Fronts and with 4-inch Tubes.

Horse Power	30	35	40	45	50	60	70	80	100	110	125	150
Diameter in inches, length in feet	40 x 12	44 x 12	48 x 12	52 x 14	56 x 14	60 x 14	64 x 16	68 x 16	72 x 16	76 x 16	80 x 18	84 x 18
Number and diameter of Tubes	20-4	24-4	29-4	34-4	38-4	44-4	49-4	54-4	59-4	64-4	69-4	74-4
Boiler without Smoke Doors	\$250	\$272	\$304	\$336	\$378	\$420	\$462	\$504	\$546	\$588	\$630	\$672
Full Flush Front	46	63	63	79	79	79	95	95	109	109	125	130
Tupper Grates	15	16	16	18	18	18	22	22	22	22	22	22
Back Wall Plate	3	3	3	3	3	3	3	3	3	3	3	3
Foot Door and Frame	9	9	9	9	9	9	9	9	9	9	9	9
Water Column and Gauges	16	16	16	16	16	16	16	16	16	16	16	16
Check and Stop Valve	4	4	4	4	4	4	4	4	4	4	4	4
Blow-Off Valve	5	5	5	5	5	5	5	5	5	5	5	5
Whistle	6	6	6	6	6	6	6	6	6	6	6	6
Smoke Stack and Guy Rope	39	41	48	55	55	57	68	106	120	120	130	130
Boiler, with fixtures and fittings	378	441	485	545	587	681	737	874	1080	1144	1271	1406
Deduct for Dome	20	24	24	29	29	36	36	46	51	51	53	53
Dry Pipe	9	12	12	12	12	14	14	17	22	22	22	22

## EXTRAS.

	10	12	17	17	17	20	20	21	27	27	27	27
Buck Stays and Rods	6	6	6	6	6	6	6	6	6	6	6	6
Wall Plates and Rolls												

For changes in Standard Boilers, see page 22

## Prices of Standard Single Flue Vertical Boilers.

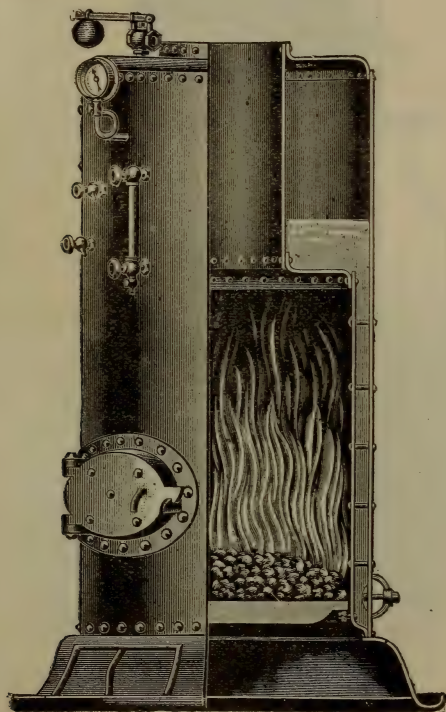
Horse Power	3	4	4½	5	6	7	7½	9	10	12	15	18
Diameter and Height	24 x 60	26 x 72	30 x 60	30 x 72	30 x 84	30 x 96	36 x 72	36 x 84	36 x 96	42 x 96	42 x 120	48 x 120
Diameter of Flue and Height of Fire Box	6-44	7-48	8-44	8-48	8-56	8-70	10-48	10-56	10-66	12-66	14-84	14-84
Boiler	\$72	\$81	\$85	\$92	\$97	\$102	\$110	\$115	\$125	\$146	\$167	\$198
Base	10	10	11	11	11	11	15	15	15	14	16	17
Grates	2	3	4	4	4	4	6	6	6	8	8	11
Glass Water Gauge	2	2	2	2	2	2	2	2	2	2	2	2
Steam Gauge	4	4	4	4	4	4	4	4	4	4	4	4
Gauge Cocks	2	2	2	2	2	2	2	2	2	2	2	2
Lever Safety Valve	3	3	3	4	4	4	4	4	4	4	4	5
Check and Stop Valve	2	2	2	2	2	2	2	2	2	2	2	2
Blow-off Valve	2	2	2	2	2	2	2	2	2	2	2	2
Boiler, with Fixtures and Fittings	99	109	115	123	128	133	147	152	162	184	205	243
Stack per foot, No. 16 Steel	45c.	45c.	50c.	50c.	50c.	50c.	60c.	60c.	60c.	70c.	75c.	75c.

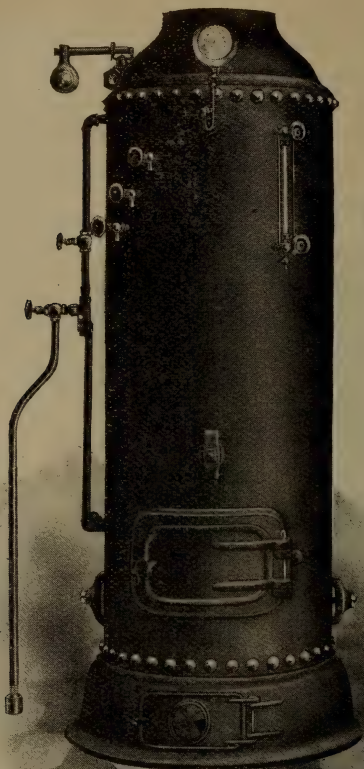
## Prices of Portable Boilers, Locomotive Style.

Number of Size	600	601	602	603	604	605	606	607	608	609	610	611
Horse Power	15	20	25	30	35	40	50	60	70	80	100	125
Diameter of Boiler in inches	32	34	36	36	40	42	44	48	54	56	60	62
Length and Width of Fire Box	44x26	52x28	52x30	52x30	52x34	54x36	64x38	64x42	64x48	64x54	64x54	66x56
No. and Diameter of Tubes	26-3	28-3	34-3	34-3	40-3	43-3	48-3	56-3	60-3	66-3	70-3	90-3
Boiler	\$204	\$330	\$366	\$380	\$410	\$480	\$542	\$634	\$712	\$760	\$1200	\$1400
Mounting on Skids	22	22	22	23	28	28	30	36	36	36	45	45
Grate Bars	8	12	16	16	19	19	20	23	29	30	34	38
Smoke Stack and Guy Rope	22	28	28	28	30	38	38	47	50	50	65	90
Lever Safety Valve	4	5	5	5	9	12	12	12	12	12	20	20
Glass Water Gauge	2	2	2	2	2	2	2	2	2	2	2	2
Steam Gauge	4	4	4	4	4	4	4	4	4	4	4	4
Gauge Cocks	2	2	2	2	2	2	2	2	2	2	2	2
Check and Stop Valve	4	4	4	4	5	5	5	5	5	5	5	8
Blow-off Valve	3	3	3	3	4	4	4	4	4	4	5	6
Whistle	4	4	4	4	5	5	5	6	6	6	6	6
Boiler, with Fixtures and Fittings	369	416	456	473	518	591	666	775	863	912	1388	1620



## Single Flue Vertical Boiler.





VERTICAL BOILER.

Our Boilers are made of flange steel 60,000 lbs. tensile strength, and the tubes are full weight, lap welded, of the best American manufacture. High grade standard fittings and trimmings.

## SPECIFICATIONS OF PLAIN VERTICAL BOILERS.

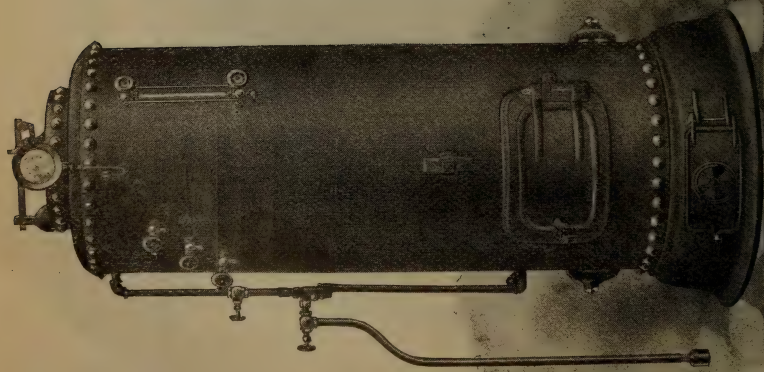
Horse Power .....	1½	2	3	4	5	6	8	10	12	14	16
Telegraphic Cipher .....	Red	Green	Yellow	Blue	Indigo	Violet	White	Black	Orange	Maroon	Purple
Diameter of Boiler, in inches .....	20	20	20	24	24	26	30	30	36	36	36
Height above base, in inches .....	36	43	49	50	60	60	60	72	72	84	96
Diameter of furnace, in inches .....	16	16	16	21	21	22	25	25	30	30	30
Height of furnace, in inches .....	18	18	18	20	20	22	24	24	24	28	32
Thickness of steel in shell .....	3-16	¼	¼	¼	¼	¼	¼	¼	¼	¼	¼
Thickness of steel in heads .....	¼	5-16	5-16	5-16	5-16	5-16	5-16	¾	¾	¾	¾
Thickness of steel in fire box .....	¼	¼	¼	¼	¼	¼	¼	¼	5-16	5-16	5-16
Length of tubes, in inches .....	18	25	31	30	40	38	36	48	48	56	64
Number of 2-inch tubes .....	16	19	19	31	31	37	43	43	55	55	55
Weight of boiler without trimmings or fixtures ..	325	430	530	640	750	840	1010	1180	1520	1800	2280
Weight of boiler complete .....	475	560	620	890	1060	1300	1550	1650	2350	2540	3000
Outside diameter of stack opening, inches .....	8½	8½	8½	10	10	11	12½	12½	16	16	16
Height from floor to top of hood, in inches .....	50	54	60	66	76	75	76	94	98	108	120

**CAST FIXTURES.**—Base, hood, fire door and grates.

**TRIMMINGS.**—Injector fitted with pipe and valves, steam gauge, water gauge, gauge cocks, safety valve and blow-off.

All Boilers above 26 inches in diameter have vertical seams, double riveted. They are made of flange steel 60,000 lbs. T. S., and are tested to 160 lbs. hydrostatic pressure.

Round bases on 1½ H. P. Boilers, and up to and including 6 H. P. Larger sizes octagon bases.



## SPECIFICATIONS OF SUBMERGED TUBULAR BOILERS.

Horse Power.....	5	8	10	12	15
Telegraphic Cipher.....	Chesnut	Oak	Walnut	Beech	Hickory
Diameter in inches.....	24	30	30	30	36
Height in inches.....	60	60	72	84	84
Height of fire box.....	24	27	28	28	30
Number of tubes.....	31	54	54	54	70
Diameter of tubes in inches....	2	2	2	2	2
Length of tubes in inches.....	18	19	27	38	38
Thickness of shell.....	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Thickness of fire box.....	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{5}{16}$
Thickness of heads.....	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
Thickness of cone.....	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{9}{32}$	$\frac{5}{16}$
Size of safety valve in inches....	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Size of blow-off in inches.....	1	1	1	1	1
Diameter of stack opening, ins.	$11\frac{1}{2}$	$11\frac{1}{2}$	$15\frac{1}{2}$	$15\frac{1}{2}$	18
Weight of boiler without fixtures	700	1075	1250	1450	1930
Weight of boiler complete.....	1200	1500	1700	1900	2700

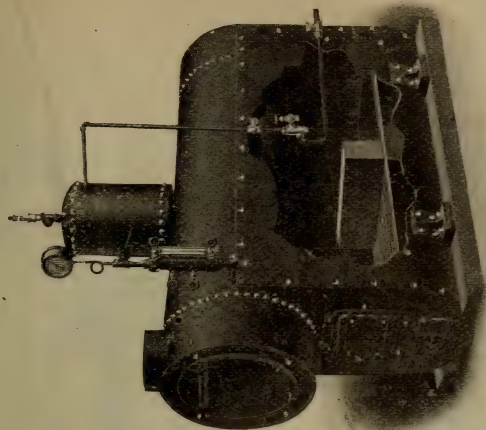
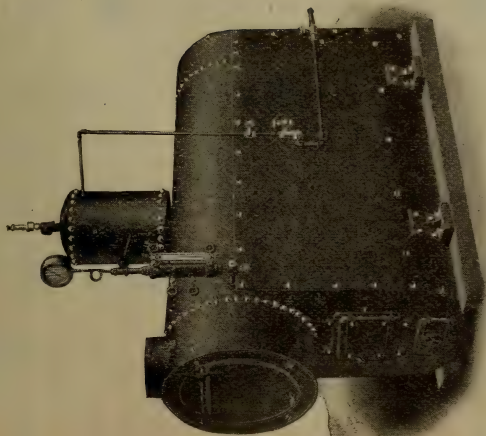
FIXTURES for the above include grates and doors, fitted with steam gauge, water gauge, gauge cocks, safety valve and blow-off valve and injector.



## IDEAL ECONOMIST BOILER.

CRAWLEY & JOHNSTON.

653



The above cuts represent our Ideal Economist Boiler, designed for work requiring moderate power in a small compass. The fire box is furnished with a full set of fire brick, which forms a complete lining.

It is made of flange steel of 60,000 lbs. tensile strength, and is built for service.

They are securely braced and stayed ; all longitudinal seams are double riveted.

It is compact, and in point of economy in the use of fuel is a very desirable and convenient Boiler. Mounted on skids.

## SPECIFICATIONS OF IDEAL ECONOMIST BOILER.

Horse Power Rating .....	4	5	6	7	8	10	12	15
Telegraphic Cipher .....	Cloth	Woolen	Linen	Cambrie	Gingham	Calico	Cotton	Muslin
Diameter of shell, inches .....	26	26	26	30	30	30	30	30
Length of tubes, feet .....	3	4	5	5	6	7	8	10
No. of 3-inch tubes .....	15	15	15	22	22	22	22	22
Thickness of shell, inches .....	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{4}$
Thickness of heads .....	5-16	5-16	5-16	5-16	5-16	5-16	5-16	5-16
Length grates, inches .....	24	24	24	24	30	30	30	36
Width grates, inches .....	20	20	20	24	24	24	24	24
Size pop safety valve, inches .....	$\frac{3}{4}$	$\frac{3}{4}$	1	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
Size blow-off valve, inches .....	$\frac{3}{4}$	$\frac{3}{4}$	1	1	1	1	1	1
No. of fire brick or tile lining .....	10	12	14	14	16	18	20	24
Size of fire brick or tile lining .....	12 x 22	12 x 22	12 x 22	12 x 24	12 x 24	12 x 24	12 x 24	12 x 24
Weight of fire brick or tile lining .....	500	600	700	800	900	1025	1150	1350
Length of stack, feet .....	20	20	20	24	24	24	24	24
Diameter of stack, inches .....	12	12	12	14	14	14	14	14
Approximate weight, complete .....	2200	2550	2875	3200	3700	4250	4800	5600


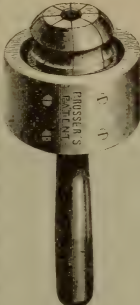
## WITH THESE BOILERS THE FOLLOWING FIXTURES AND FITTINGS ARE FURNISHED:

Smoke box extension, door and stack saddle, grate bars, bearing bars, bridge wall, fire brick lining, pop safety valve, steam gauge and siphon, water column with glass water gauge, two gauge cocks; feed, check and blow-off valves; injector fitted to boiler, whistle and valve, smoke stack and guys four times length of stack. Detachable domes enable convenient loading in box cars, as well as economy in freight charges.

## EXPANDERS

## PROSSER'S SPRING TUBE EXPANDER.

Prosser Patent Tube Expanders are in use wherever there is a Boiler Shop. Tubes put in by this method—being expanded on both sides of the Tube plate—serve as “braces” of the most efficient kind; the ends of the Tubes also retain their original strength, and are not reduced in thickness and thereby weakened as by the rolling process.

Price Each Spring Expanders.	Diam. of Tube, Inches.	Price Each Ring Expanders.
		
\$ 8 00	1 $\frac{1}{4}$	\$11 00
9 00	1 $\frac{1}{2}$	12 00
11 00	1 $\frac{3}{4}$	13 00
12 00	2	15 00
13 00	2 $\frac{1}{4}$	18 00
15 00	2 $\frac{1}{2}$	22 00
18 00	2 $\frac{3}{4}$	26 00
22 00	3	30 00
26 00	3 $\frac{1}{4}$	33 00
30 00	3 $\frac{1}{2}$	37 00
33 00	4	45 00
37 00	4 $\frac{1}{2}$	52 00
42 00	5	56 00
60 00	6	75 00

## ROLLER TUBE EXPANDERS.

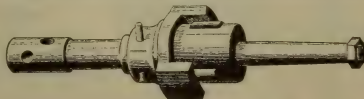
## CLASS “A.”



Diameter, inches.....	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$
Price each.....	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
Diameter, inches.....	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5
Price each.....	18.00	20.00	23.00	25.00	30.00	35.00	40.00	50.00

To meet the demand for better grade expanders than the Class “A.” are made the following three styles of hardened steel forgings. Although the price is a little higher than that of Class “A.” it will be found much cheaper in the end to use this grade tool, as one of these will outwear several of the commoner expanders.

## CLASS “B.”



This expander is similar to the Class “A.” the difference being that it is made of material mentioned above

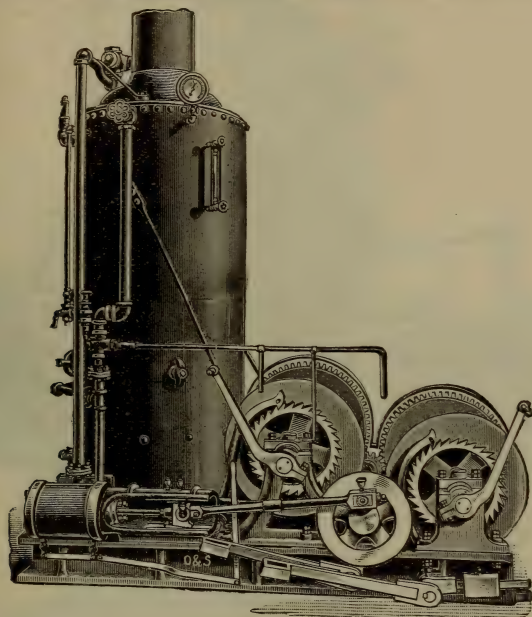
Diameter, inches.....	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$
Price each.....	10.00	10.00	10.00	10.00	10.00	12.00	14.00	16.00
Diameter, inches.....	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{4}$	4 $\frac{1}{2}$	5
Price each.....	18.00	20.00	23.00	25.00	30.00	35.00	40.00	50.00





**DOUBLE CYLINDER, DOUBLE FRICTION DRUM HOISTING ENG.****With Boiler and Fixtures Complete on One Bed-Plate.**

Especially adapted for Quarry and Bridge work, Building, Mason work, etc.

**TABLE DIMENSIONS AND PRICE LIST.**

Size and Number of Engine...	70	70 1/4	71
Horse-Power as usually rated	10	15	25
Size of Cylinder, inches	5x7	6 1/4 x 8	7x10
Diameter of Drums, inches	12	14	14
Diameter of Flanges, inches	22	26	30
Length of Drums between Flanges, inches	20	24	32
Size of Boiler, inches	30x72	36x84	42x84
Number 2-inch Tubes	55	60	84
Floor Space required, inches	42x78	48x88	60x104
Weight Hoisted, Single Rope, usual Speed, pounds	2000	2500	4000
Approximate Shipping Weight, lbs	5500	7000	9000
Price complete as shown	\$1080 00	\$1320 00	\$1520 00

# DOUBLE CYLINDER, SINGLE FRICTION DRUM HOISTING ENGINE.

WITHOUT BOILER.

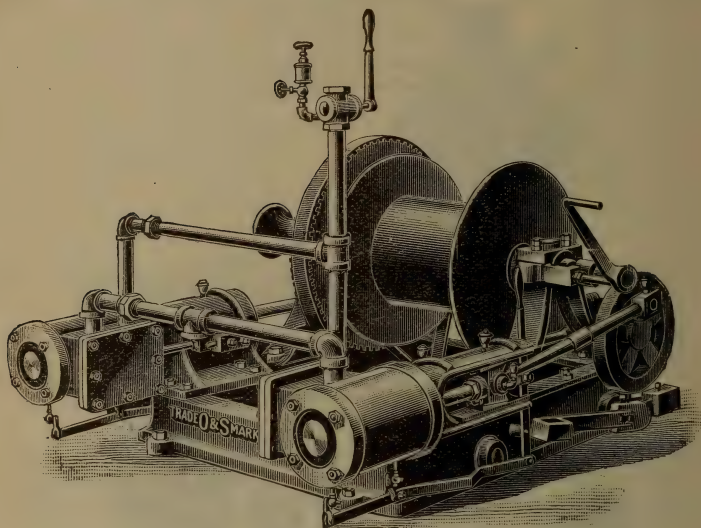
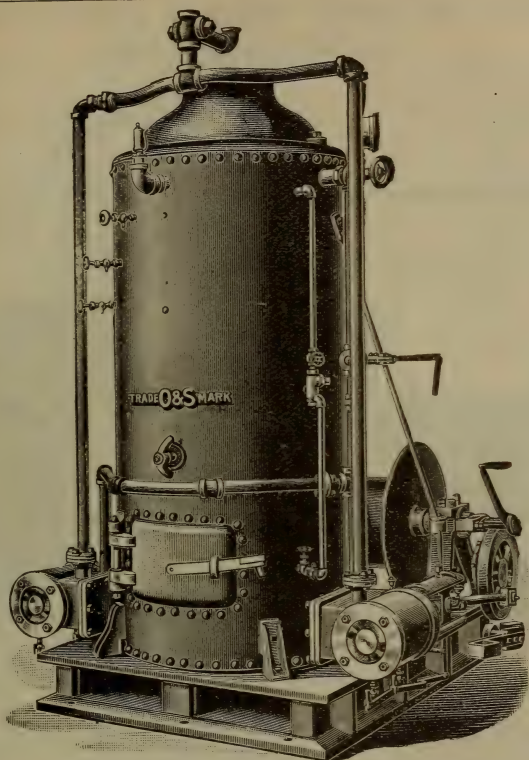


TABLE OF DIMENSIONS AND PRICE LIST

Size Number of Engine.....	33½	34	35
Horse-Power as usually rated.....	10	15	25
Size of Cylinder, inches.....	5 x 7	6½ x 8	7 x 10
Diameter and Length of Drum, inches .....	12 x 14	14 x 16	14 x 20
Floor Space required, inches.....	35 x 48	42 x 53	51 x 64
Weight hoisted, single rope, usual speed, pounds..	2000	2500	4000
Approximate Shipping Weight, pounds .....	2000	2300	3000
Price complete as shown ....	\$570 00	\$660 00	\$780 00

## DOUBLE CYLINDER, FRICTION DRUM HOISTING ENGINE.

With Boiler and Fixtures Complete on One Bed-Plate.



All our Horizontal Hoisting Engines are Equipped with Gear-Wheels cut from the Solid Metal.

TABLE OF DIMENSIONS AND PRICE LIST.

Size Number of Engine	7½	8	9	Dia. of Pinion, inches....	6	6½	8
Horse-Power as usually rated	10	15	25	Size of boiler, inches....	30x72	36x84	42x84
Size of Cylinder, inches	5x7	6¼x8	7x10	Number 2-inch Tubes....	55	60	84
Diameter of Drum, inches	12	14	14	Floor Space, required, in	42x60	48x70	60x81
Diameter of Flanges, in	22	26	30	Suitable Weight for Pile-Driving Hammer	1500	2000	4000
Length of Drum between Flanges, inches....	20	24	32	Approximate Shipping Weight, pounds.	4000	5300	8000
Dia. of Gear-Wheel, in...	25	26½	32½	Price complete as shown	\$850	\$1,060	\$1,350

**DOUBLE CYLINDER, DOUBLE FRICTION DRUM  
HOISTING ENGINE.  
WITHOUT BOILER.**

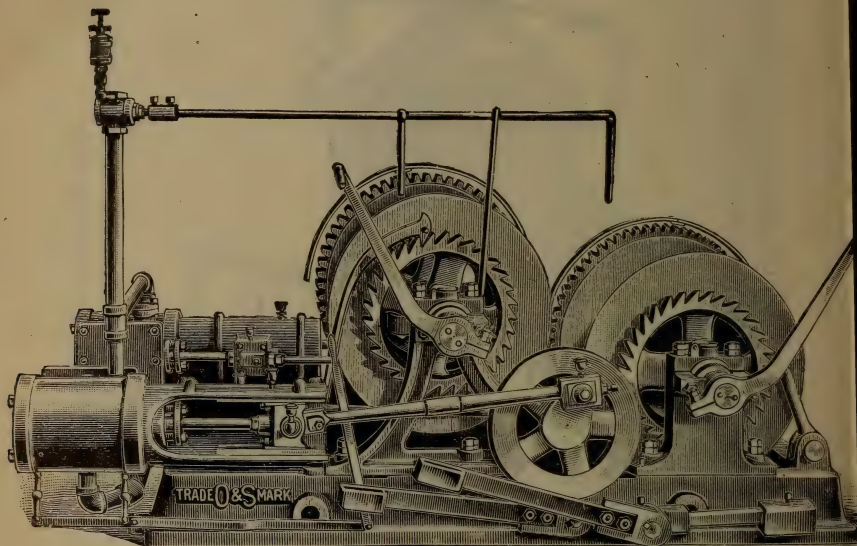
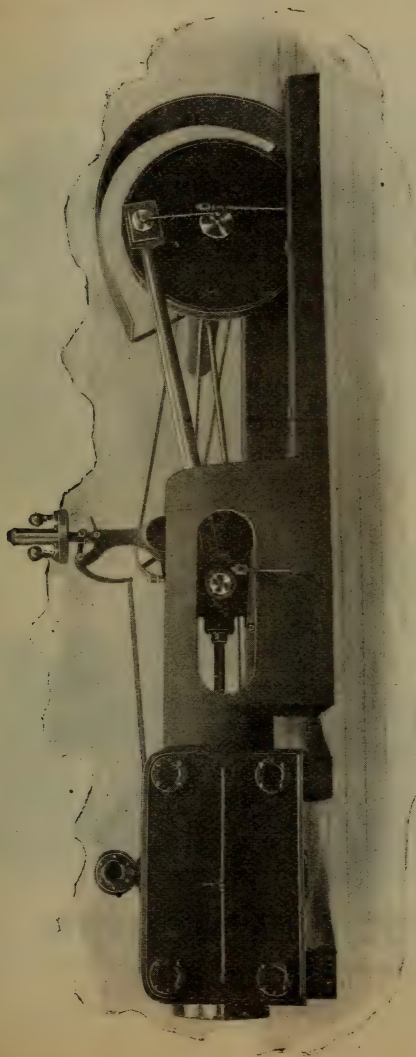


TABLE OF DIMENSIONS AND PRICE LIST

Size Number of Engine.....	70 $\frac{3}{4}$	71 $\frac{1}{2}$
Horse-Power as usually rated.....	15	25
Size of Cylinder, inches .....	6 $\frac{1}{4}$ x 8	7 x 10
Diameter and Length of Drum, inches .....	14 x 16	11 x 20
Floor Space required, inches.....	42 x 81	51 x 96
Weight hoisted, single rope, usual speed.....	2500	4000
Approximate Shipping Weight, pounds .....	4000	5500
Price complete as shown .....	\$860 00	1010 00





### SIDE CRANK, HEAVY DUTY CORLISS ENGINE

HIGH DASH POTS.

DOUBLE ECCENTRICS.

DOUBLE PORTS.

HEAVY DUTY FRAME WITH

CONTINUOUS BEARING ENTIRE  
LENGTH ON FOUNDATION.

DESIGNED FOR HIGH

STEAM PRESSURE AND

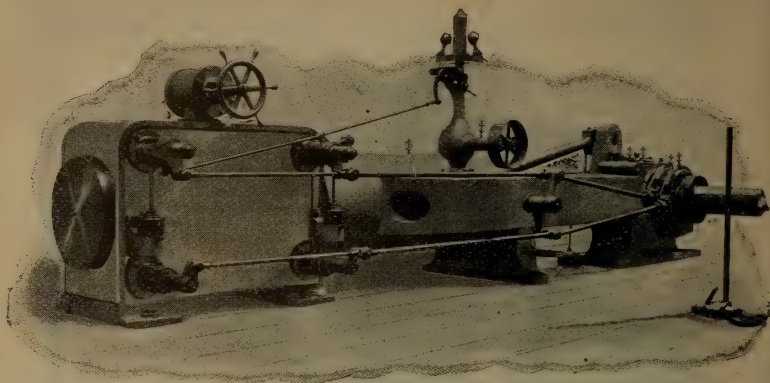
ANY REASONABLE SPEED.

THE LARGEST SHAFTS

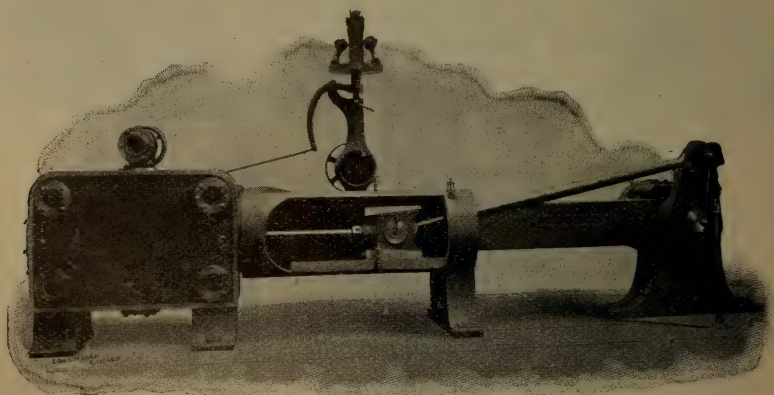
AND WEARING SURFACES.

CLOSEST REGULATION.

Prices on Application.

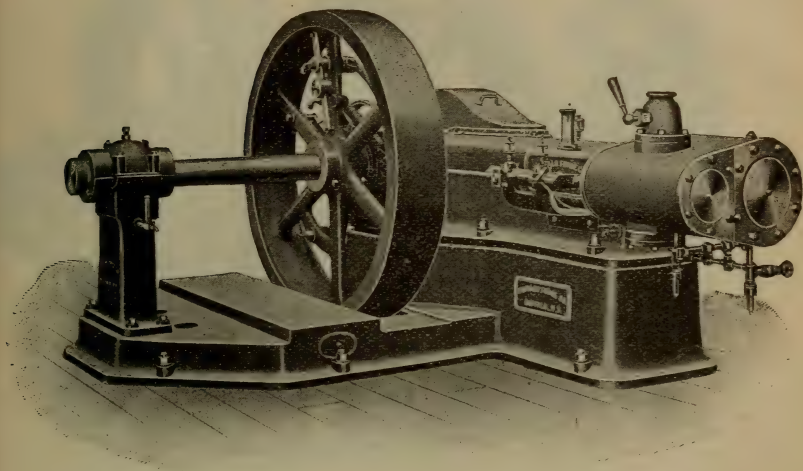


VALVE GEAR SIDE, COLUMBIAN CORLISS ENGINE



CRANK SIDE, COLUMBIAN CORLISS ENGINE

Prices on Application.

**AUTOMATIC HIGH SPEED ENGINES.**

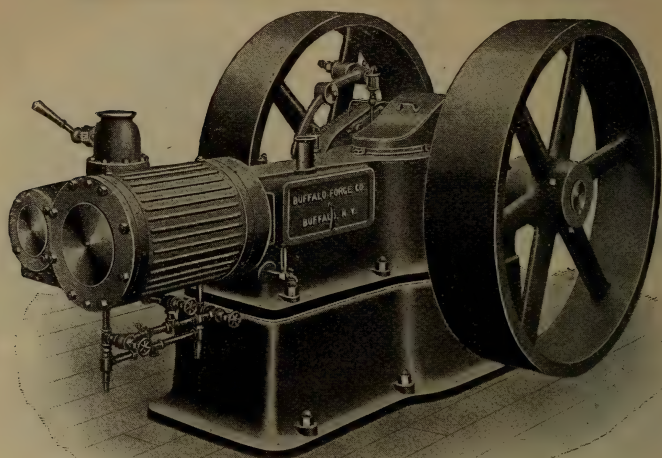
BUFFALO HORIZONTAL SIDE CRANK ENGINE.

Buffalo Side Crank Engines are provided with a rigid cast iron sub-base which provides a support for the engine bed, the ring oiling out-board bearing, and the dynamo, in the case of direct-connected sets.

Other parts of this engine are the same as the parts of the standard center crank engine, which we now describe. The crank shaft is a single forging of the best open-hearth steel. The forged steel connecting rod is handsomely proportioned and provided with adequate means for adjustment at each end. The cross-head guides are cast a part of the frame. The cylinder and valve chest are cast in one piece, accurately bored and counter-bored. The piston is cast one piece, and is light but rigid. The valve is of the piston type, perfectly balanced, and readily adjustable.

The valve motion is obtained from a swinging eccentric controlled by a shaft governor. This governor embodies several nice points of regulation which cannot be described here. The lubrication is copious and unfailing.

## AUTOMATIC HIGH SPEED ENGINES.



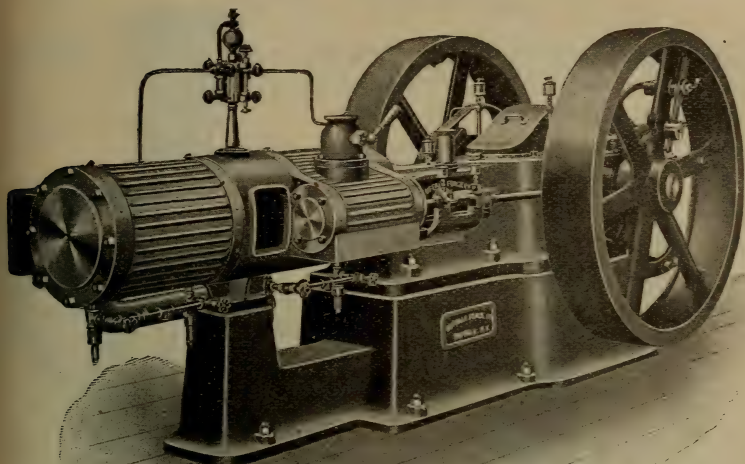
BUFFALO HORIZONTAL CENTER-CRANK ENGINE.

These engines meet all requirements where a short stroke, unvarying high rotative speed and self-contained construction are required. For a description of parts, see following page.

TABLE OF DIMENSIONS AND POWERS.

Cylinder		Main Bearings		Revolutions per Minute	Horse-Power, $\frac{1}{4}$ Cut-off, 80 pounds pressure	Shipping Weight in Pounds
Diam.	Stroke	Diam.	Length			
6	8	$3\frac{1}{2}$	$6\frac{1}{8}$	350 to 400	17 to 19	3,500
8	8	$3\frac{1}{2}$	$6\frac{5}{8}$	300 " 350	25 " 30	3,900
10	8	$3\frac{1}{2}$	$6\frac{7}{8}$	300 " 350	40 " 47	4,100
8	10	$4\frac{1}{2}$	8	300 " 350	32 " 37	5,380
10	10	$4\frac{1}{2}$	8	300 " 350	50 " 58	6,430
12	10	$4\frac{1}{2}$	8	250 " 300	59 " 71	6,555
10	12	5	$9\frac{3}{4}$	250 " 275	50 " 55	9,250
12	12	5	$9\frac{3}{4}$	250 " 275	72 " 78	9,450
13	12	5	$9\frac{3}{4}$	250 " 275	84 " 93	9,750
12	14	6	$10\frac{3}{4}$	250 " 275	84 " 92	14,926
14	14	6	$10\frac{3}{4}$	250 " 275	114 " 126	15,426
14	15	7	$10\frac{3}{4}$	200 " 250	98 " 122	16,495
15	15	7	$10\frac{3}{4}$	200 " 250	112 " 140	16,920
15	16	7	$10\frac{3}{4}$	200 " 225	120 " 134	17,920
16	16	7	$10\frac{3}{4}$	200 " 225	136 " 153	18,420



**AUTOMATIC HIGH SPEED ENGINES.****BUFFALO HORIZONTAL TANDEM COMPOUND ENGINE.**

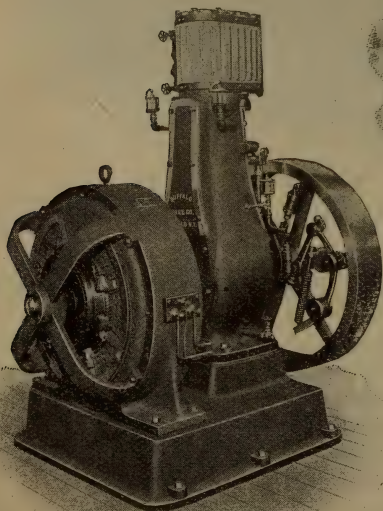
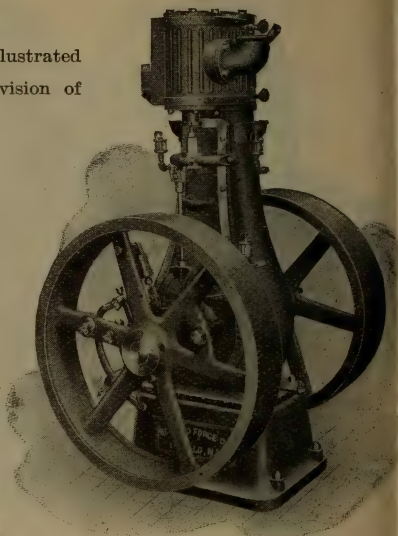
This illustration will afford an idea of the general appearance of the Buffalo Horizontal Tandem Compound Engines.

The overhung low-pressure cylinder is bolted to a cylinder yoke, which rests upon a pedestal extension of the sub-base, a longitudinal expansion joint connecting the two. Between the yoke and frame is carried the high-pressure cylinder casting with the high-pressure valve chamber. The piston rod is of the finest machine steel. The three detachable cylinder heads are so fastened that they can be readily removed with pistons and piston rod, without disturbing the cylinders.

The high-pressure valve, controlled by a shaft governor, is of the standard, balanced and adjustable piston type; the low-pressure valve is of the "D" slide type. The lubrication, governor and other parts are as on the Standard Horizontal Center-Crank Engine.

**AUTOMATIC HIGH SPEED ENGINES.**

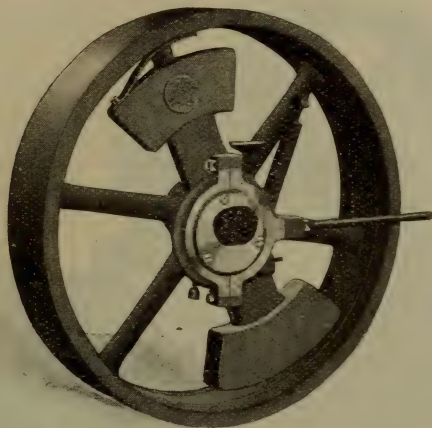
The Single Vertical Engine here illustrated is arranged to run in oil by the provision of removable oil-tight side plates. The cast-iron frame, formed with a graceful contour, provides for the guide within and carries above the cylinder and valve chest. These are cast in one piece to reduce clearance, radiating surface and weight.

**BUFFALO VERTICAL DIRECT-CONNECTED ENGINE.****BUFFALO SINGLE VERTICAL ENGINE.**

The accompanying illustration shows very nicely the possibilities in the way of compact, direct-connected sets, using the Buffalo Single Vertical Engine. In addition, the close regulation and copious lubrication of these engines is characteristic. All types of Buffalo engines may be had with extended sub-base for direct connection to standard dynamos.

## OUR "JEWEL."

A HIGH-CLASS, PERFECTLY GOVERNED, AUTOMATIC ENGINE  
AT MODERATE COST.



Governor in Fly-Wheel.

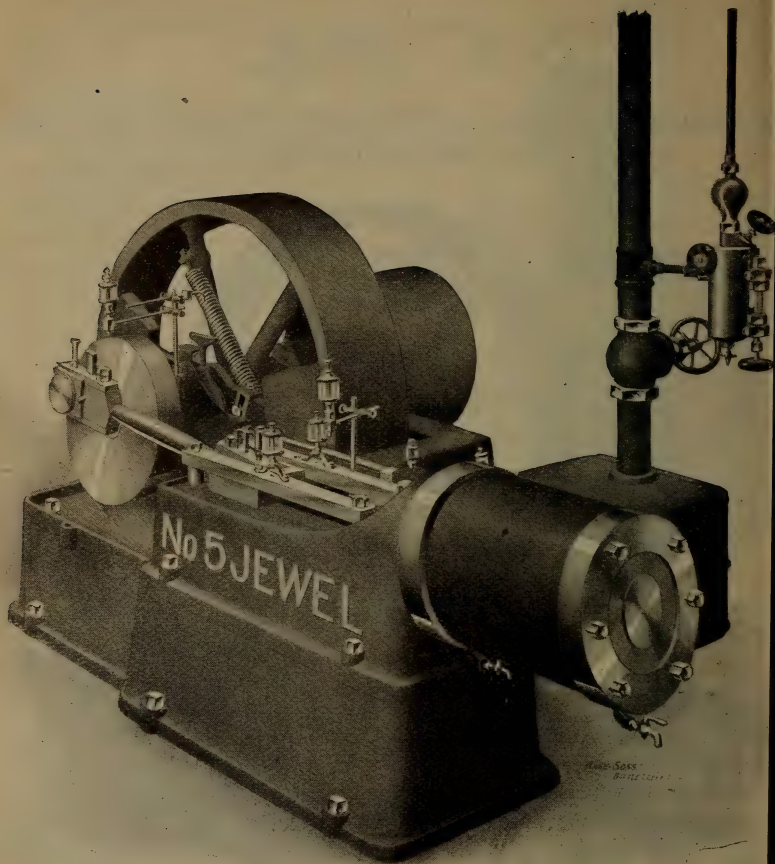
THIS engine has been in use for a number of years with the BEST POSSIBLE RESULTS, and has gained a wide reputation in the way of economy and service. Handsome and attractive in design, strong and well built, equipped with every modern improvement, a great economizer in use of steam, with perfect regulation, it is a successful, durable engine.

The Jewel is now equipped with the Rites governing system, and with a new, perfectly balanced valve.

The Governor consists of but a single piece, swinging upon a common supporting pin, and marks the climax of simplicity, and insures the least possible chance for derangement.

With the balanced valve used, this governor produces a regulation that is practically perfect, speed being constant with and without a load.

The fact that this type of governor has been adopted by almost the entire engine trade of the better class, is convincing evidence of its perfection.



## The IMPROVED JEWEL

AUTOMATIC ENGINE,  
With RITES GOVERNOR.



# DIMENSIONS AND POWERS OF THE JEWEL AUTOMATIC CUT-OFF ENGINES.

Based on 80 lbs. Initial Pressure, Cut-Off at  $\frac{1}{4}$  Stroke.

TRIMMINGS.—We ship with each Engine a complete set of glass oilers, sight-feed lubricator, one throttle valve and two cylinder cocks.

Engine Number....	1	2	3	4	5	6	7	8	9	10
Telegraphic Cipher.....	Diamond	Ruby	Emerald	Pearl	Opal	Garnet	Turquoise	Amethyst	Sapphire	Topaz
Horse Power Rating ....	6 to 8	8 to 10	10 to 12	15 to 18	20 to 25	30 to 35	40 to 45	50 to 55	60 to 65	70 to 75
Revolutions per Minute.	AT | AT 260 | 380	AT | AT 230 | 320	AT | AT 230 | 300	AT | AT 220 | 280	AT | AT 220 | 260	AT | AT 220 | 260	AT | AT 200 | 230	AT | AT 200 | 225	AT | AT 200 | 225	AT | AT 200 | 225
Cylinder.....	4½ in.	5 in.	6 in.	7½ in.	8 in.	9¼ in.	10 in.	10 in.	11 in.	12 in.
Steam Pipe.....	6 in.	7½ in.	7½ in.	8 in.	10 in.	10 in.	12 in.	15 in.	15 in.	15 in.
Exhaust Pipe.....	1¼ in.	1¼ in.	1½ in.	2 in.	2 in.	2 in.	2½ in.	3 in.	3½ in.	4 in.
Fly-Wheel. { Bore.....	1½ in.	1½ in.	2 in.	2½ in.	2½ in.	2½ in.	3 in.	4 in.	4½ in.	5 in.
{ Stroke.....	30 in.	30 in.	30 in.	35 in.	42 in.	42 in.	48 in.	60 in.	60 in.	60 in.
{ Face.....	6½ in.	6 in.	6 in.	7 in.	9¼ in.	9¼ in.	9¼ in.	12 in.	12 in.	12 in.
{ Weight.....	135 lbs.	200 lbs.	340 lbs.	435 lbs.	660 lbs.	660 lbs.	750 lbs.	1000 lbs.	1000 lbs.	1300 lbs.
Belt Pulley. { Diameter.....	14 in.	16 in.	18 in.	20 in.	20 in.	24 in.	24 in.	30 in.	30 in.	35 in.
{ Face.....	6 in.	7 in.	8 in.	10½ in.	12 in.	12 in.	12 in.	12 in.	12 in.	14 in.
Diameter of Shaft.....	2½ in.	2½ in.	2½ in.	3 in.	3 in.	3 in.	3 in.	3½ in.	4 in.	4 in.
Floor Space.....	52 x 36	64 x 38	64 x 38	69½ x 46½	73 x 54	73 x 54	112 x 60	120 x 78	120 x 78	120 x 78
Weight, Complete.....	700 lbs.	1050 lbs.	1275 lbs.	1850 lbs.	3150 lbs.	3300 lbs.	4500 lbs.	7200 lbs.	7700 lbs.	8200 lbs.

Every engine thoroughly tested under actual service conditions before shipment.

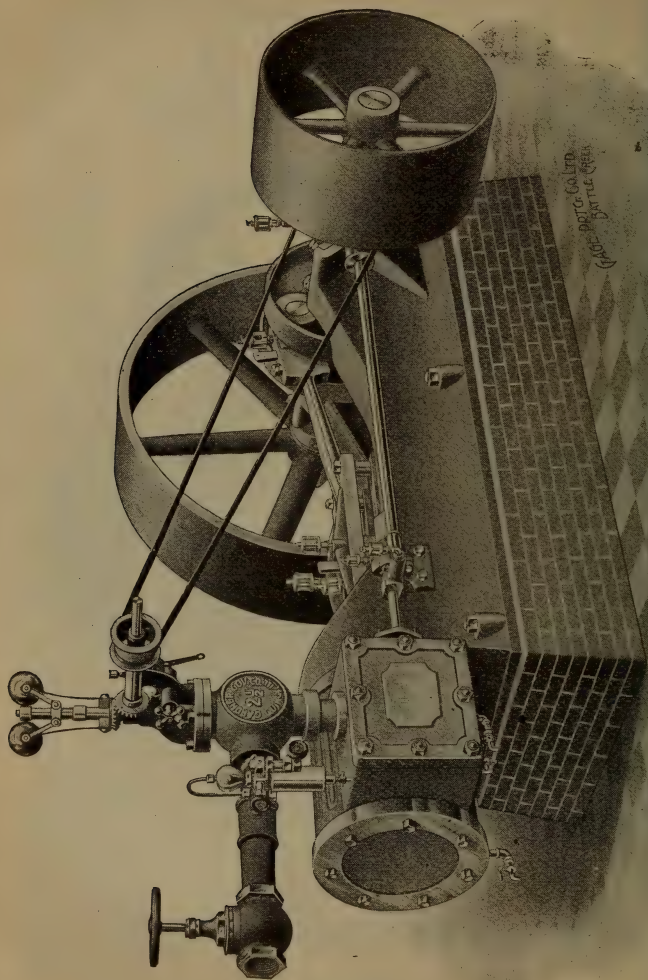
In our No. 1 Jewel the sub-base and frame is one solid casting.

On crank pin we use center oilers on Nos. 1, 2 and 3. On other sizes we use wipe oilers.

Engines are set to run at the highest speed, when leaving our factory, unless otherwise ordered.

All engines are right-hand and run over (top of fly-wheel running away from cylinder).

Extra charge made for foundation bolts.



HORIZONTAL CENTER-CRANK ENGINE.

# HORIZONTAL CENTER-CRANK ENGINE.

Our horizontal center-crank is a strong, simple, plain engine.

The lower slides, the journal boxes, the center of the Cylinder, the cross-head and the crank shaft bearings are in a direct line, thus relieving the studs which hold the upper slides from all strain, and bring the thrust of the crank bearings directly on the engine bed and not on the studs. The cylinder, ways and cross-head are of the modern locomotive pattern. The piston has self-adjusting packing rings. The cylinder heads are overhanging and polished, and in connection with the iron jacket, present a surface always bright, and one that can be easily kept clean. The connecting rods and eccentric rod have adjusting brass boxes.

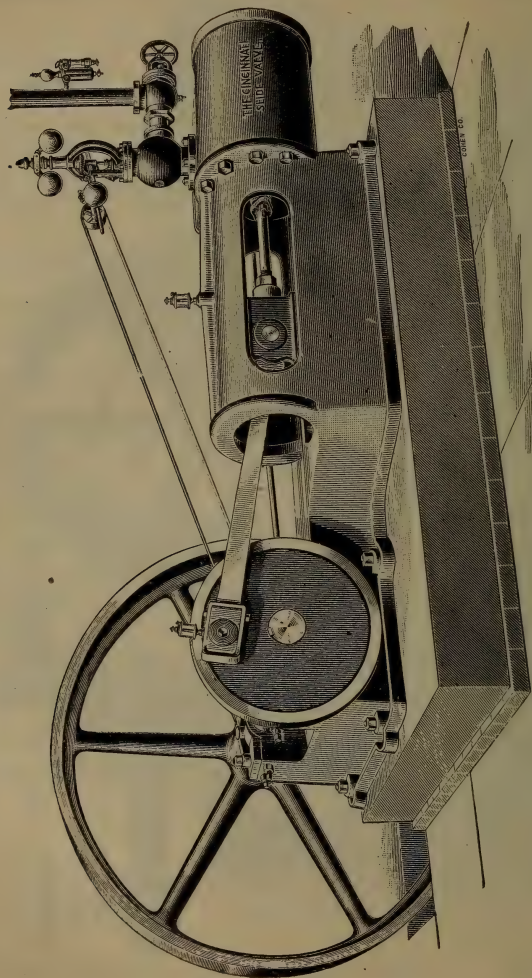
We justly claim for this Engine large wearing surfaces, durability, great rigidity and strength, extreme simplicity and few parts.

All our engines are run and tested under actual working pressure before shipping, and are known to be in perfect working order.

Rated Horse Power	4	6	8	10	12	15	20	25	35	40	50
Telegraphic Cipher.....	Ape	Cow	Cat	Dog	Elk	Fox	Pig	Rat	Deer	Bear	Coon
Cylinder { Bore, inches..	4	5	6	7½	7½	8	9¼	10	10	11	12
Stroke, inches	5	7½	7½	8	9	10	10	12	15	15	15
Steam Pipe, inches.....	¾	1	1¼	1½	1½	1½	2	2½	2½	3	3½
Exhaust Pipe, inches...	1	1¼	1½	2	2	2	2½	3	3½	4	4½
Revolutions per Minute.	300	250	200	200	180	180	150	150	150	150	150
Governor Pulley { Diam	4½	5½	6½	9	9	9	9	9	8¼	8¼	8¼
Face..	1½	1¾	1¾	2	2	2	2	2	2¾	2¾	2¾
Fly Wheel { Diam., ins..	17	24	24	30	30	35	40	48	60	60	60
Face, inches	4½	6	6	6¾	6¾	7¼	9¼	12	12	12	12
Weight, ins.	65	170	170	180	180	350	420	500	1000	1000	1250
Belt Pulley { Diam., ins.	12	14	14	16	18	18	20	24	30	30	36
Face, ins...	5	6½	6½	7½	8½	8½	12	12	12½	12½	12½
Weight complete, lbs...	350	650	700	1200	1250	1600	2350	3160	4500	4800	5200
Diameter of Shaft, inches	1½	1½	1½	2¾	2¾	2¾	3	3¾	3¾	4¾	4¾
From foundation top to center of shaft, inches.	6½	7¼	7¼	7¼	7¼	7¼	10	11½	13	13	13
Floor Space, inches... {	44	62	62	78	79	80	84	96	127	127	127
	x	x	x	x	x	x	x	x	x	x	x
	30	36	36	42	42	42	55	54	74	74	74

**TRIMMINGS.**—The above engines include governor, governor pulley and belt, glass oilers, cylinder lubricator, throttle valve and cylinder cocks.

Price List Opposite.



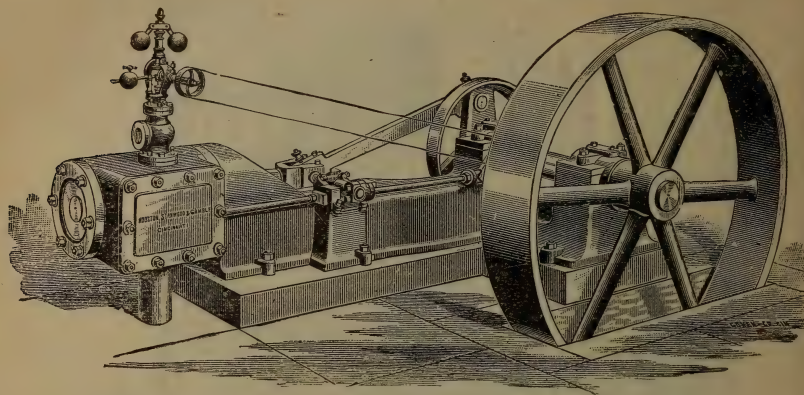
CINCINNATI SIDE CRANK HORIZONTAL STEAM ENGINE.



# PRICE LIST AND DIMENSIONS CINCINNATI HORIZONTAL SIDE CRANK ENGINE

Size of Engine.	Revs. per Minute	Rated H. P. 75 lbs. Boiler Press.	MAIN SHAFT. Diam. & Length.	CRANK PIN. Diameter and Length.	CROSSHEAD PIN. Diameter and Length.	STEAM PIPE. Diam.	Exhaust Pipe. Diam.	Size of Gov'or.	FLOOR SPACE. Approximated.	BAND FLY WHEEL.			Weight of Engine Complete, lbs.
										Diam.	W'th	W'ght lbs.	
7x14	200	18	3 $\frac{1}{8}$ " x 57"	2 $\frac{1}{8}$ " x 2"	1 $\frac{7}{8}$ " x 2"	2"	2 $\frac{1}{2}$ "	2"	94" x 54"	42"	9"	380	2,632
8x14	200	24	3 $\frac{1}{8}$ " x 57"	2 $\frac{1}{8}$ " x 2"	1 $\frac{7}{8}$ " x 2"	2"	3"	2"	100" x 56"	48"	10"	500	2,790
9x16	180	30	4 $\frac{1}{8}$ " x 68"	2 $\frac{1}{8}$ " x 2 $\frac{1}{2}$ "	1 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	3"	2 $\frac{1}{2}$ "	108" x 66"	54"	12"	800	3,680
10x16	180	37	4 $\frac{1}{8}$ " x 68"	2 $\frac{1}{8}$ " x 2 $\frac{1}{2}$ "	1 $\frac{1}{2}$ " x 2 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	2 $\frac{1}{2}$ "	116" x 70"	60"	14"	1,000	4,294
11x18	160	45	5 $\frac{3}{8}$ " x 79"	3 $\frac{3}{8}$ " x 3"	2 $\frac{3}{8}$ " x 3"	3"	4"	3"	128" x 76"	66"	14"	1,300	5,930
12x18	160	54	5 $\frac{3}{8}$ " x 79"	3 $\frac{3}{8}$ " x 3"	2 $\frac{3}{8}$ " x 3"	3"	4"	3"	136" x 84"	72"	16"	1,600	6,370
13x21	140	65	5 $\frac{1}{2}$ " x 84"	3 $\frac{1}{8}$ " x 3 $\frac{1}{2}$ "	2 $\frac{1}{8}$ " x 3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	144" x 90"	78"	16"	1,800	7,990
14x21	140	75	5 $\frac{1}{2}$ " x 84"	3 $\frac{1}{8}$ " x 3 $\frac{1}{2}$ "	2 $\frac{1}{8}$ " x 3 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	4 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "	150" x 92"	84"	17"	2,200	8,770
15x24	130	92	6 $\frac{1}{2}$ " x 92"	3 $\frac{1}{8}$ " x 4"	2 $\frac{1}{8}$ " x 4"	4"	5"	4"	160" x 100"	96"	17"	2,800	12,200
16x24	130	105	6 $\frac{1}{2}$ " x 92"	3 $\frac{1}{8}$ " x 4"	2 $\frac{1}{8}$ " x 4"	4 $\frac{1}{2}$ "	6"	4 $\frac{1}{2}$ "	162" x 104"	96"	18"	3,200	13,300
17x27	120	122	7 $\frac{1}{8}$ " x 100"	4 $\frac{1}{8}$ " x 5"	3 $\frac{1}{8}$ " x 5"	4 $\frac{1}{2}$ "	6"	4 $\frac{1}{2}$ "	190" x 120"	108"	24"	5,000	16,750
18x27.	120	135	7 $\frac{1}{8}$ " x 100"	4 $\frac{1}{8}$ " x 5"	3 $\frac{1}{8}$ " x 5"	5"	6"	5"	192" x 132"	120"	25"	6,000	17,800

See cut opposite.



## THE **H-S-G** STANDARD ENGINE.

### SIZES AND PROPORTIONS.

NUMBER DESIGNATING SIZE OF ENGINE	NOMINAL HORSE-POWER	CYLINDER.		BAND FLY-WHEEL			SIZE OF GOV- ERNOR AND STEAM PIPE.	SIZE OF EXHAUST PIPE	REV. PER MIN TO GIVE NOMINAL H. P.	SHAFT.		SPACE OCCUPIED.	
		Bore.	Stroke	Diam.	Face.	Weight				Diam.	Length	Length	Bre'dth
		Inches	Inches	Inches	Inches	Pounds.				Inches	Inches	Inches	Inches
<b>11</b>	16	<b>7</b>	<b>12</b>	42	8	400	1½	3	<b>200</b>	3¾	44	92	54
<b>18</b>	25	<b>8</b>	<b>14</b>	48	10	600	2	3	<b>200</b>	3¾	48	99	59
<b>22</b>	30	<b>9</b>	<b>14</b>	54	12	970	2½	3½	<b>200</b>	3¾	48	102	59
<b>32</b>	40	<b>10</b>	<b>16</b>	60	14	1,190	2½	3½	<b>165</b>	4¾	60	121	72
<b>43</b>	45	<b>11</b>	<b>18</b>	66	14	1,500	3	4	<b>150</b>	4¾	60	126	72
<b>51</b>	60	<b>12</b>	<b>18</b>	72	16	1,885	3	4	<b>150</b>	5¾	69	139	83
<b>67</b>	70	<b>13</b>	<b>20</b>	78	16	2,180	3½	4½	<b>140</b>	5¾	69	144	83
<b>78</b>	80	<b>14</b>	<b>20</b>	84	17	2,550	3½	4½	<b>140</b>	5¾	69	148	83
<b>98</b>	100	<b>15</b>	<b>22</b>	96	18	3,330	4	5	<b>130</b>	6¾	78	165	95
<b>112</b>	115	<b>16</b>	<b>22</b>	96	21	3,800	4½	6	<b>130</b>	6¾	78	165	97

NOMINAL HORSE POWER BASED ON 80 LBS. STEAM PRESSURE.

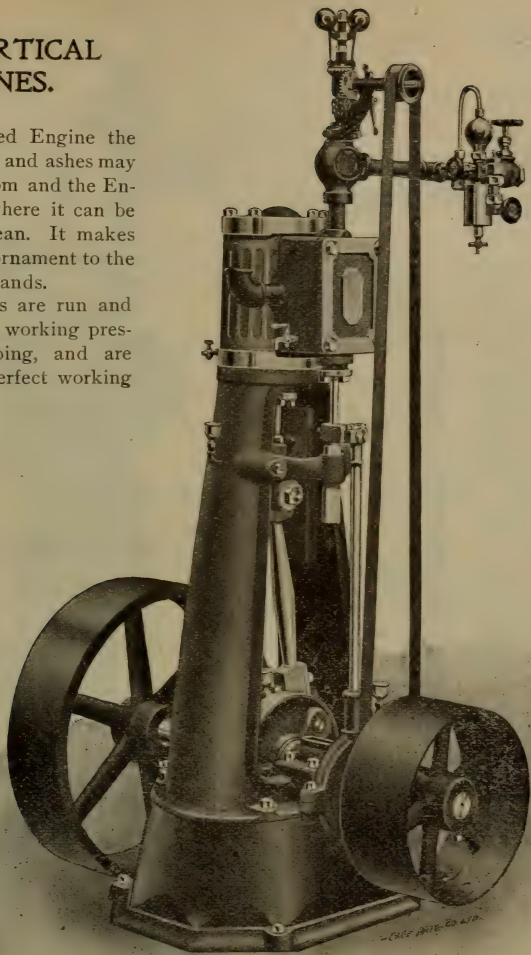
TO FIND FULL INDICATED POWER OF ENGINE: MULTIPLY THE NUMBER, WHICH DESIGNATES SIZE OF ENGINE, BY BOILER PRESSURE, BY REVOLUTIONS PER MINUTE; DIVIDE THE PRODUCT BY 10,000; QUOTIENT = MAXIMUM INDICATED HORSE-POWER.

We furnish with these Engines the following fittings: Governor with Automatic Safety Stop, Throttle Valve, Fly Band Wheel, Spanner Wrenches, Automatic Sight Feed Cylinder Lubricator, Oil Cups and Cylinder Cocks.

## OUR VERTICAL ENGINES.

With a detached Engine the Boiler with its dirt and ashes may be kept in one room and the Engine in another, where it can be kept cool and clean. It makes no dirt, and is an ornament to the room in which it stands.

All our Engines are run and tested under actual working pressure before shipping, and are known to be in perfect working order.



# VERTICAL ENGINES.

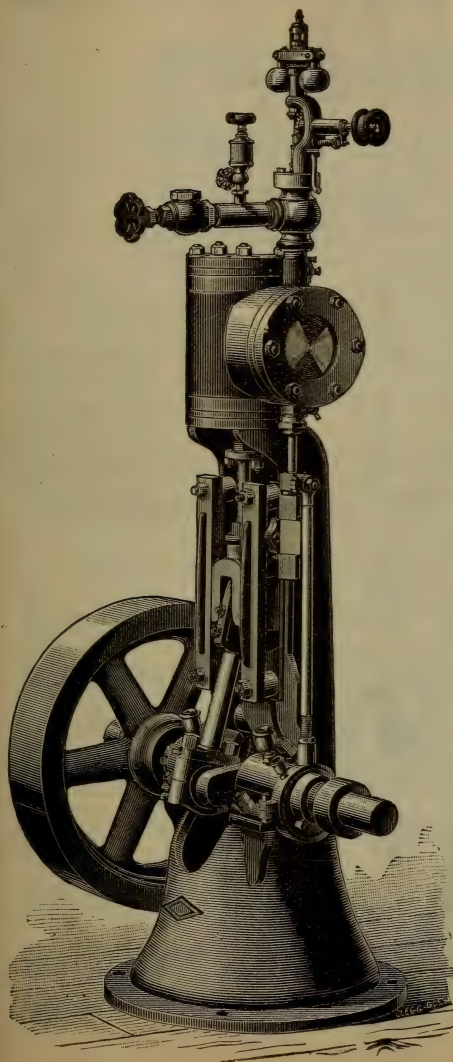
Neat and simple in design, strong and durable in construction. Discs are heavy cast iron. Shaft and wrist-pin best grade of machinery steel, pressed together with hydraulic pressure and keyed. Steel connecting rods. Brasses of best box metal, and all parts of the engine adjustable. High grade standard trimmings furnished. All engines run and tested under actual working pressure.

## DIMENSIONS OF VERTICAL ENGINES.

	1	2	3	4	5	6	8	10	12	15
<b>Rated Horse Power</b> .....	Celery	Carrot	Turnip	Parsnip	Radish	Cabbage	Squash	Lettuce	Beans	Peas
Telegraphic Cipher.....										
Cylinder..... { Bore.....	2½ in. 3 in.	3 in. 5 in.	3½ in. 5 in.	4 in. 5 in.	4½ in. 5 in.	5 in. 7½ in.	6 in. 7½ in.	7½ in. 8 in.	7½ in. 9 in.	7½ in. 10 in.
Steam Pipe..... { Stroke.....	¾ in.	¾ in.	¾ in.	¾ in.	¾ in.	1 in.	1½ in.	1½ in.	1½ in.	1½ in.
Exhaust Pipe.....	½ in.	¾ in.	¾ in.	1 in.	1 in.	1¼ in.	1½ in.	2 in.	2 in.	2 in.
Revolutions per minute.....	400	350	350	300	300	250	200	200	180	180
Belt Pulley..... { Diameter.....	6 in. 3¾ in.	10 in. 4½ in.	10 in. 4½ in.	12 in. 5 in.	12 in. 5 in.	14 in. 6½ in.	14 in. 6½ in.	16 in. 7½ in.	18 in. 8½ in.	18 in. 8½ in.
Governor Pulley { Diameter.....	3 in. 1¾ in.	4 in. 1½ in.	4 in. 1½ in.	4½ in. 1½ in.	4½ in. 1½ in.	5½ in. 3¾ in.	6½ in. 1¾ in.	9 in. 2 in.	9 in. 2 in.	9 in. 2 in.
Floor Space, inches.....	14 x 26	18 x 20	18 x 20	18 x 20	18 x 20	20 x 22	20 x 22	22 x 24	22 x 24	22 x 24
Height to top of Cylinder.....	30 in.	3 ft. 6 in.	3 ft. 6 in.	3 ft. 6 in.	3 ft. 8 in.	4 ft. 8 in.	4 ft. 10 in.	5 ft. 2 in.	5 ft. 3 in.	5 ft. 4 in.
Weight.....	170 lbs.	275 lbs.	300 lbs.	425 lbs.	500 lbs.	700 lbs.	850 lbs.	1250 lbs.	1400 lbs.	1500 lbs.
Balance Wheel. { Diameter.....	13 in.	15 in.	15 in.	17 in.	17 in.	24 in.	24 in.	30 in.	30 in.	35 in.
Face..... { Weight.....	3½ lbs.	45 lbs.	4 in.	4½ in.	4½ in.	6 in.	6 in.	6¾ in.	6¾ in.	7½ in.
Diameter of Shaft.....	1½ in.	1½ in.	1½ in.	1½ in.	1½ in.	1½ in.	1½ in.	1¾ in.	2 in.	2 in.

TRIMMINGS.—The above include governor, governor pulley and belt, throttle valve, oil cups, cylinder lubricator, belt wheel, balance wheel and air cock.





## DIAMOND SAFETY STEAM ENGINE...

An extra heavy engine for continuous work.

A design permitting access to all parts.

A little more expensive in first cost than the general run of small vertical engines, but a better built and more durable piece of machinery.

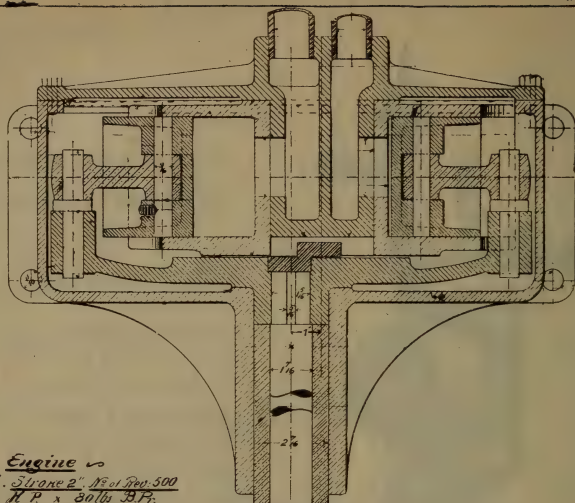
### PRICE LIST.

#### Price and Principal Dimensions

##### IN INCHES.

Diam. Cyld.	3	4 $\frac{1}{4}$	6	7
Diam. Shaft	1 $\frac{3}{16}$	1 $\frac{7}{16}$	1 $\frac{5}{16}$	2 $\frac{7}{16}$
Stroke.....	4	5	6	7
Height "H"	37	44	51	55
Wheel Diam	13	18	24	30
Face.....	3	4	5	6
Floor to C Shaft	12 $\frac{1}{4}$	15	15	17
Diam. Base.	15	18	21	23
Bearing.....	3 $\frac{3}{4}$	4	5	5
Steam Pipe	$\frac{1}{2}$	$\frac{3}{4}$	1	1 $\frac{1}{4}$
Exhaust Pipe	$\frac{3}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$

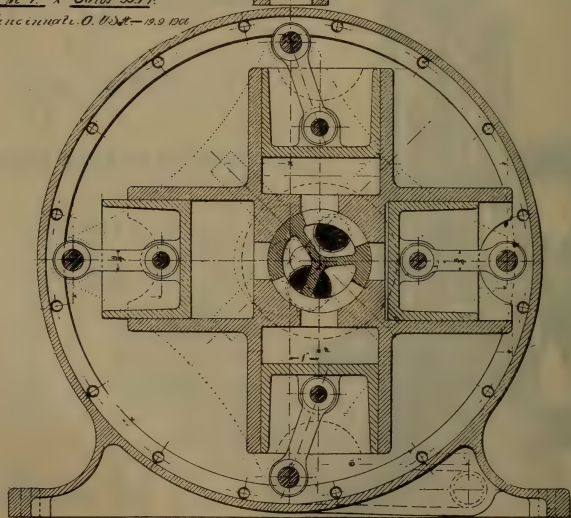
Price,	\$130	\$180	\$220	\$280
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*Engine*

*Bore 4". Stroke 2". Net Pw. 500  
6 H.P. x Bulbs B.P.*

*- Cincinnati, O. U.S.A. - 1910*



ALL PATENT RIGHTS RESERVED.

# JOHNSTON'S HIGH SPEED ENGINE.

ALL PATENT RIGHTS RESERVED.

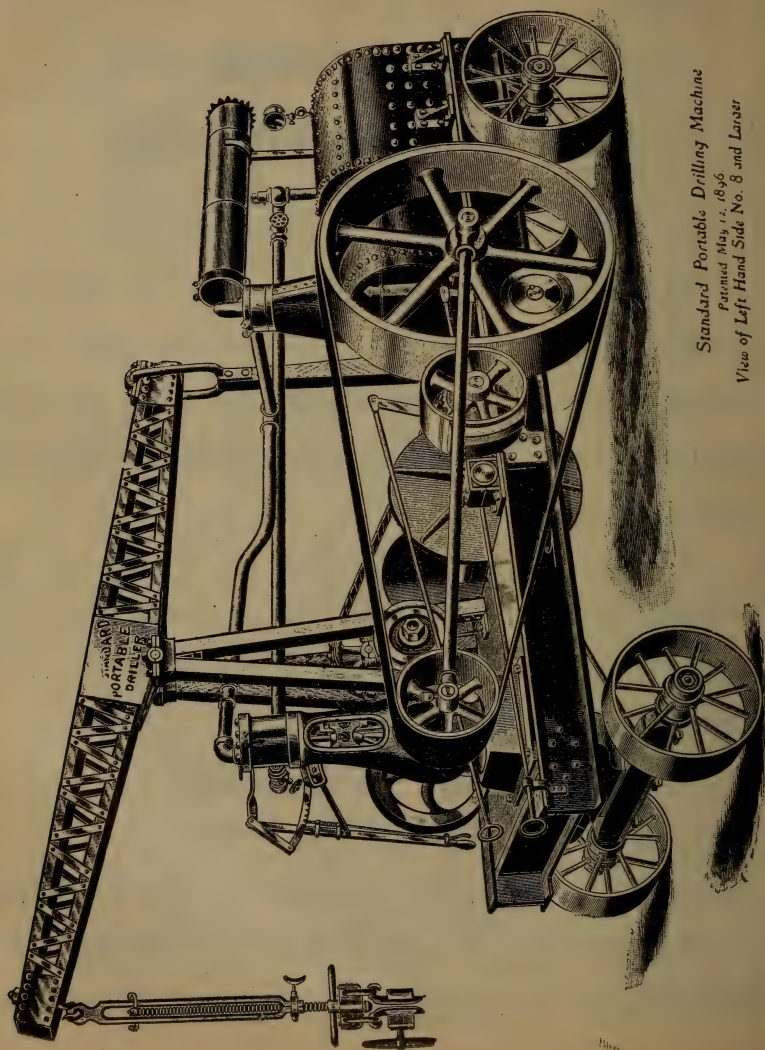
This engine is adapted for steam, air or water pressure. We recommend it especially for direct connected work, in driving dynamos, fans, blowers, pneumatic tools, saw mill feeds, steam steerers, capstans, automobiles, etc.

The cut shows a fixed cut off which can be arranged to suit conditions. This engine is also built with a reversing valve, having a fixed cut-off while running in either direction.

**No Waste. No Dead Center.**

**Very Economical. Durable.**

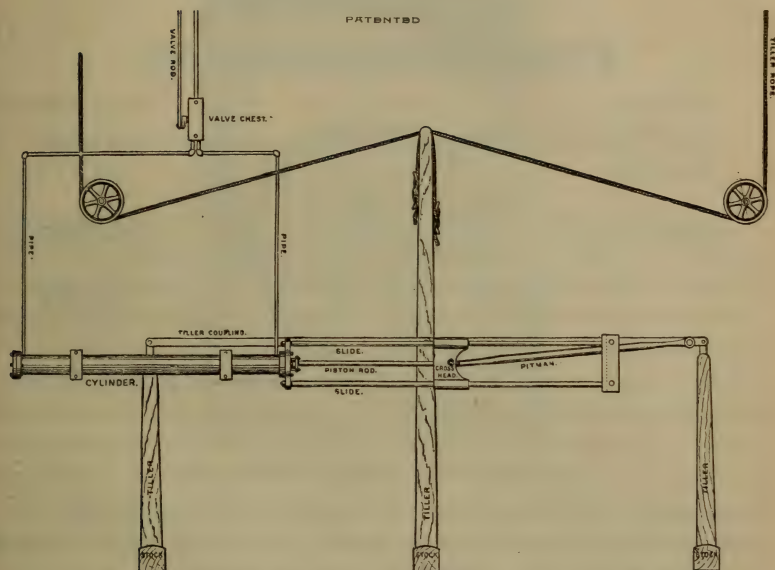
Manufacturers of machinery requiring a special engine for direct connected work will find this to be a superior engine at a moderate price. **Correspondence Solicited.**



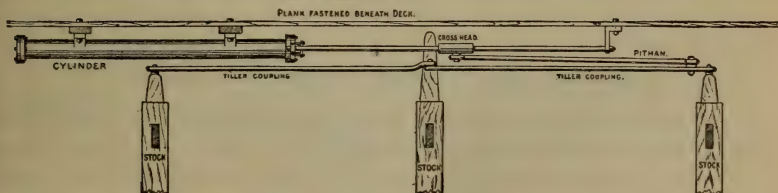
Standard Portable Drilling Machine  
Patented May 12, 1896  
View of Left Hand Side No. 8 and Larger



## STEAM STEERING GEAR.



Plain View—Showing how the "CINCINNATI" STEAM STEERING GEAR is applied to Stern Wheel Boats.



Rear View—This View shows a Side View of Cylinder looking at it from the Stern of Boat, aft of Rudder Stocks.

JOHNSTON'S PATENTS.

**LEVER BRAKE**  
**STEAM STEERING GEAR.**

---

**ADAPTED FOR RIVER, LAKE AND OCEAN STEAMERS.**

---

On opposite page cuts show the manner in which the Steering Engine is erected. It consists of one cylinder which is securely fastened either above or below the tillers, depending upon circumstances, and connected to tillers by means of the pitman shown. When the levers in the pilot house are pulled to the starboard the valve is opened which admits steam to the inboard of end cylinder, pulling rudders to starboard; when levers are pulled to larboard, steam is admitted to the outboard end of cylinder, which pulls the rudders to larboard. The valve chest is erected as near the cylinder as possible, and is so arranged that when one end of the cylinder is taking steam, the opposite end is exhausting. While all the parts are strong and well fit, we have taken great pains to make the Gear as light as possible; the steering engine weighing from 400 to 1200 pounds, depending upon the size of boat.

---

**AUTOMATIC STEAM STEERING GEAR.**

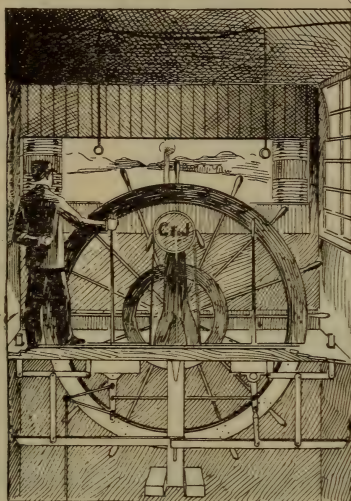
Engine is placed as shown on opposite page and described above. The steam valve is operated by the tightening of tiller rope.

---

**SEND FOR SPECIAL CIRCULARS.**

JOHNSTON'S PATENT

**HAND AND  
STEAM  
STEERING  
GEAR.**

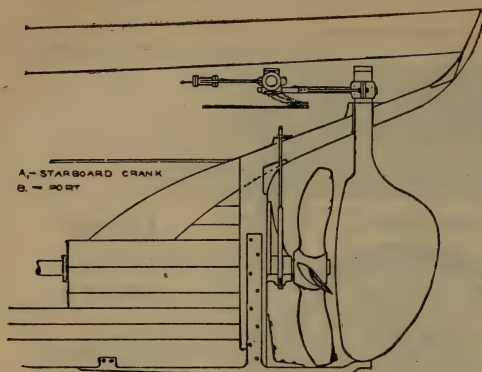


**LEVER  
BRAKE  
STEERER.**

### THE MAN BEHIND THE WHEEL.

The cut shows the arrangement of levers in pilot house, they are placed directly aft of the pilot wheel, one on each side, and so connected to the valve chest, shown in cut above, by means of suitable rods, etc.; the levers are also connected to the foot brake beam in a manner which causes the pressure to be put upon the brake when the levers are in the center, as shown in cut, holding the wheel in that position until the levers are moved, which removes the pressure from the foot brake and allows the wheel to turn without resistance as the steam is admitted to the cylinder; after the wheel has traveled as far as desired, the levers being brought again to the center, shuts off the steam and sets the brake, thereby overcoming the momentum of the pilot wheel, and stopping it in any position desired. By this means it is possible to operate the wheel as fast or as slow as desired, and at the same time hold it any position.

The above combination enables us to offer the fastest, easiest operated and most reliable Steam Steering Gear ever offered.

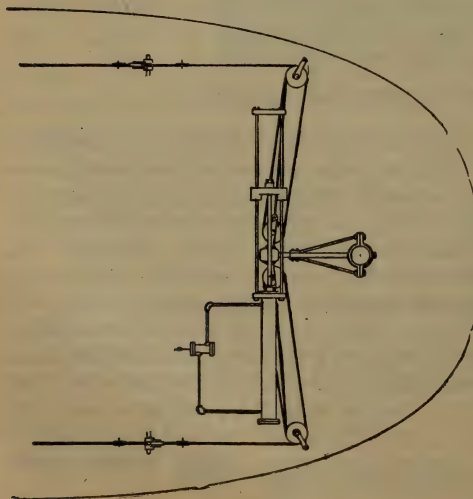


SHOWING GEAR CONNECTED  
DIRECT TO TILLER, THERE BEING  
NO INCREASED STRAIN ON ROPES.

JOHNSTON PATENT  
STEAM STEERING GEAR.

## PROPELLER WHEEL BOATS.

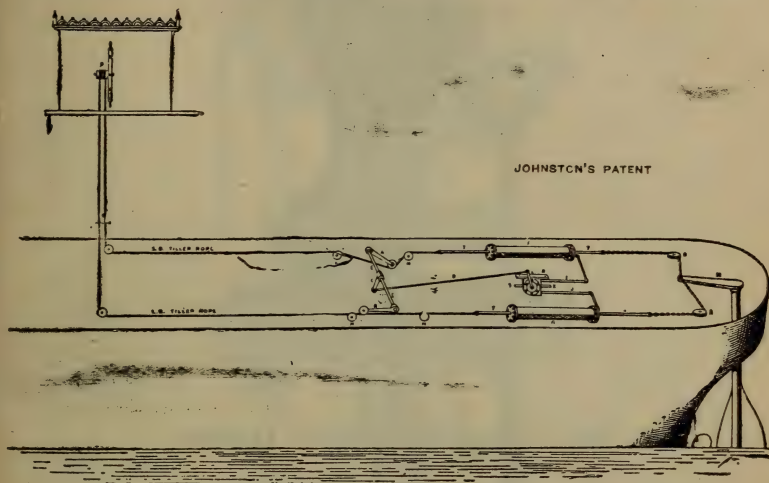
These cuts show the manner in which the Steering Engine is erected on Propeller-wheel boats. This places the machinery where it is out of the road, and at the same time it is of easy access, and where it can be under the immediate supervision of the engineer. The arrangement of levers in pilot house are similar to those shown in cut on opposite side with such alterations as are necessary, on account of the smaller pilot wheel generally used on boats of this class. We have taken special care to adapt this Gear for Lake boats.



Prices and further information  
given upon solicitation.



## Cincinnati Automatic Steam Steering Gear.

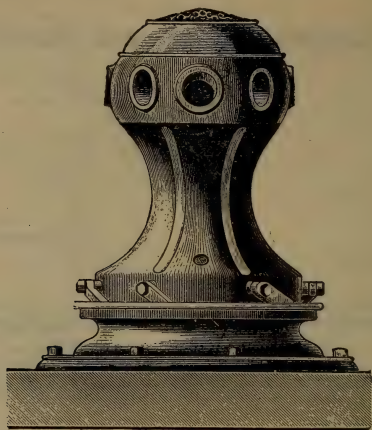


**The Cincinnati Steam Steerer** has been used on the Lakes for years. The peculiar feature of the principle on which this great gear operates, is its great range of adaptability. The first gears made consisted of two cylinders, one on either side of the boat, and working with steam on but one end; this has been modified so that but one cylinder is used, taking steam at either end. The valve is separate from the cylinder and may be placed at quite a distance from it.

All the attention that this gear requires from the engineer, is a small quantity of cylinder oil regularly supplied. An oil pipe can be run to the engine room, and a small hand-pump attached, or it can be piped to the main hand oil-pump. All other oiling belongs to the deck department and should be done whenever the wheel ropes are inspected and greased.

There is no gear in use to-day that approaches to the **Cincinnati Steam Steerer** in simplicity and certainty of action. If five pounds of steam will not handle the rudder, the valve will continue to give it more until the pressure does handle it, and the same in case the rudder is moved by an outside force, the pressure increases until it is sufficient to overcome whatever force is acting and throw the rudder back to its original position.

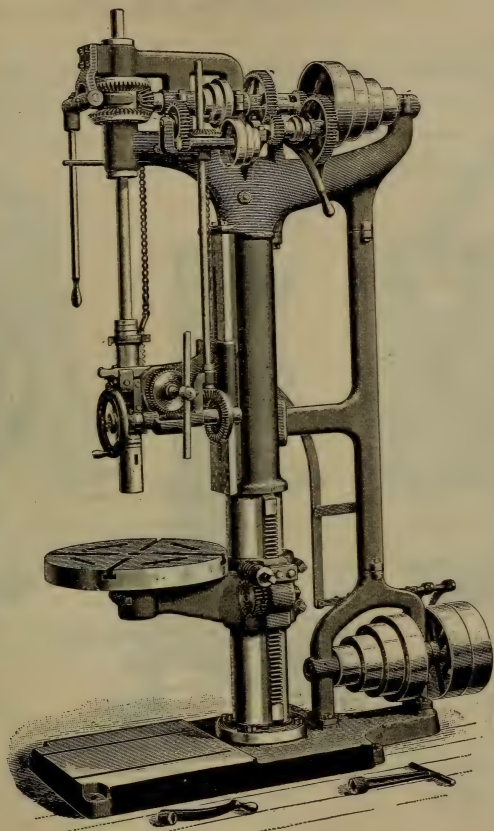
The valve is worked automatically by the tiller rope.



### The "Providence" Power Capstan.

Patented December 3, 1878; October 19, 1886; and November 12, 1889.  
For description, see pages 56 and 57

Number.	Diameter of Barrel.	Diameter of Base.	Height.	Weight.	Size of Ropes.	Price.
0	7 in.	19 in.	20½ in.	240 lbs.	3½ in.	
A	8 "	23 "	27½ "	420 "	4 "	
B	8½ "	24½ "	31½ "	560 "	4½ "	
C	9½ "	29½ "	34½ "	850 "	5 "	
D	10½ "	32 "	37½ "	1,090 "	6 "	
E	11½ "	34 "	39½ "	1,300 "	7½ "	
F	12½ "	37½ "	43½ "	1,650 "	9 "	



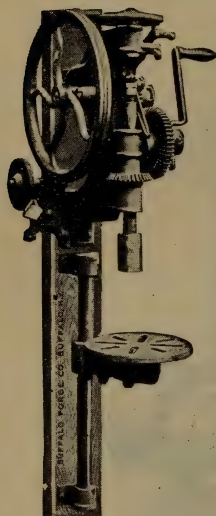
The Cincinnati Upright Drills with Geared Tapping Attachment on Spindle.

21-, 24-, 28-, 32-, 36-, and 42-Inch Swing.

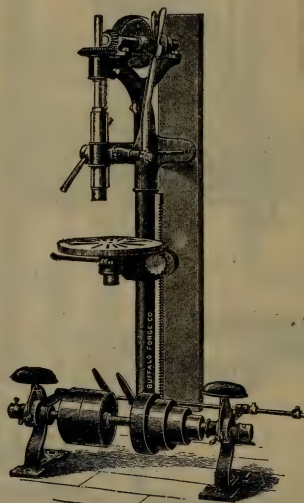
PATENT APPLIED FOR.)

**BLACKSMITH DRILLS.**

The various designs of Buffalo Drills are adapted to a wide variety of uses. Each drill is unique in that it is more complete and embodies a greater number of desirable points than any other of the same cost. The workmanship and material are of the highest order. All shafts and screws are of the best steel.



No. 61B, WITH EMERY WHEEL.  
PRICE \$34.00.



No. 87 POWER DRILL.  
PRICE \$120.00.



No. 68, WITH AUTOMATIC FEED  
PRICE \$24.00.

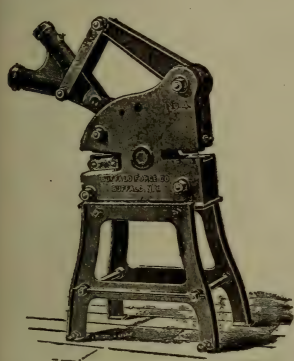
The gears are machine cut and are unexcelled in smoothness of action. The bearings are solid, not babbitted, but are bored out and reamed to standard gauges. Each Buffalo Drill will be found superior in efficiency, ease of operation and all points which combine to make a perfect machine.

Forty-five different styles of drills are included in this line, so that the requirement of any user can easily be met.



## PUNCHES, SHEARS AND BAR CUTTERS.

The mechanism of each of these tools is unique. Durability, compactness and power are so combined as to secure perfection of operation. These tools are especially valuable to tanners, sheet iron workers and blacksmiths, and for general shop work where power hand tools are necessary.



PUNCH, SHEAR AND BAR  
CUTTER, COMBINED.



INDEPENDENT PUNCH.



CONTINUOUS SHEAR.

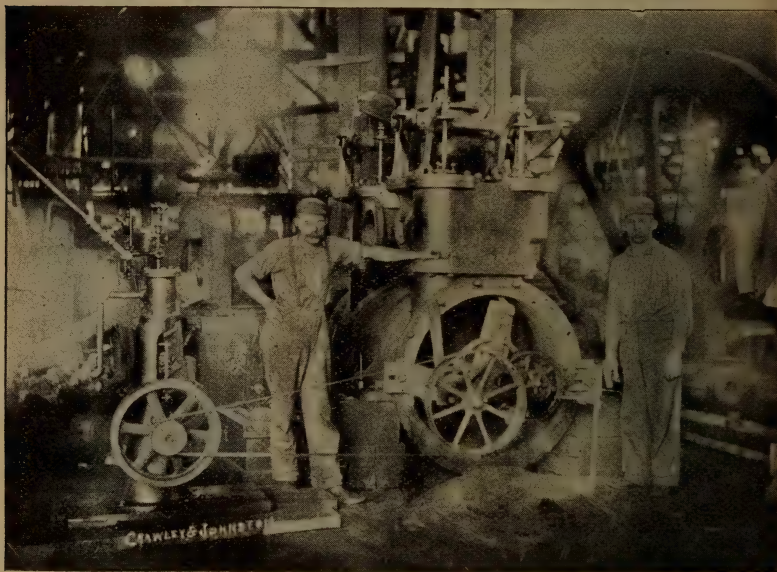
Every machine sold is guaranteed to have the capacity claimed for the respective sizes, and to do such work readily and without crowding.

### PRICE LIST, SIZES AND DIMENSIONS.

Nos. 1, 2, 3, 4—Combined Punch, Shear and Bar Cutter. Nos. 6, 7, 8, 9—Shears.  
Nos. 12, 13, 14, 15—Punches. No. 16 Angle Iron Cutter.

No.	Punches and Dies Furnished	Capacities			Price
		Shear	Punch	Cut-off Round Iron	
1	$\frac{3}{32}, \frac{1}{8}$	$\frac{1}{4}$ -in. strap iron, $1\frac{1}{2}$ in. wide	$\frac{1}{8}$ in. in $\frac{1}{2}$ in. iron	0 to $\frac{3}{8}$ in.	\$ 40.00
2	$\frac{1}{8}, \frac{1}{16}, \frac{1}{4}$	$\frac{1}{2}$ " " " 2 " "	$\frac{1}{4}$ " " " " " "	$\frac{1}{4}$ " " $\frac{3}{4}$ "	50.00
3	$\frac{1}{4}, \frac{3}{8}, \frac{3}{4}$	$\frac{1}{2}$ " " " 3 " "	$\frac{3}{8}$ " " " " " "	$\frac{3}{8}$ " " 1 " "	70.00
4	$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$	$\frac{5}{8}$ " " " 3 " "	$\frac{1}{2}$ " " " " " "	1 " " 1 $\frac{1}{4}$ "	100.00
6		0 to $\frac{1}{8}$ in. thickness.		0 " $\frac{3}{8}$ "	30.00
7		0 to $\frac{1}{16}$ " " "		0 " $\frac{1}{2}$ "	40.00
8		0 to $\frac{1}{4}$ " " "		$\frac{1}{4}$ " $\frac{5}{8}$ "	50.00
9		0 to $\frac{5}{16}$ " " "		$\frac{3}{8}$ " $\frac{3}{4}$ "	100.00
12	$\frac{3}{32}, \frac{1}{8}$		$\frac{1}{8}$ in. in $\frac{1}{2}$ in. iron.		30.00
13	$\frac{1}{8}, \frac{1}{16}, \frac{1}{4}$		$\frac{1}{4}$ " " " " " "		40.00
14	$\frac{1}{4}, \frac{3}{8}, \frac{3}{4}$		$\frac{3}{8}$ " " " " " "		50.00
15	$\frac{1}{4}, \frac{3}{8}, \frac{1}{2}$		$\frac{1}{2}$ " " " " " "		60.00
16		Will cut up to 3 in. x 3 in. x $\frac{1}{4}$ in. angle iron or steel.			40.00

Extra punches \$1.00 each, extra knives \$1.00 each, extra cutters \$1.00 per pair.



### **Boring Cylinders without Removing From the Engine Any Size.**

In addition to having our Machine Shop equipped with the Best Modern Tools for Shop Work, we have a variety of Special Portable Tools for "outside work" Cylinder Boring Bars, Crank Eye Boring Tools, Key Seat Cutters, Valve Seat Cutters and Facing Machines, Pipe Mills, etc., etc.



# Steamboat Supplies,

PACKINGS, VALVES, HOSE,

BARGE UNIONS, OILERS, BRASS GOODS, ETC.

## Steamboat Machine Shop Work.

We have one of the most complete Machine Shops in the West with full equipment of Modern Tools, Patterns, etc., for Steamboat Work.

## USEFUL INFORMATION

The areas of circles are to each other as the squares of their respective diameters. In other words, doubling the diameter of a pipe or cylinder increases its capacity (area of circle) four times. Friction of liquids in pipes increases as the square of the velocity.

Every foot of height in a column of water represents .434 pound pressure to the square inch; in common practice, however, it is estimated that every foot in height represents one-half pound pressure to the square inch.

A cubic inch of water weighs .03617 pound.

A cubic foot of water weighs 62.355 pounds avoirdupois.

A gallon of water weighs 8.34 pounds.

A gallon of water contains 231 cubic inches.

A cubic foot of water contains 1,728 cubic inches.

A cubic foot of water contains 7.4805 gallons.

For the benefit of those interested we offer below a few suggestions and rules applicable to pumps, concerning capacity, speed, and power required in operating, etc.

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches, or a column of water 33.9 feet high at sea level.

Theoretically, water can be raised vertically by suction about 34 feet; but since it is impossible to obtain a perfect vacuum, 25 to 28 feet is about as great a vertical distance as we would recommend a pump (the cylinder of working barrel) to be placed above the water to insure its successful operation.

## CAPACITY

To compute the capacity of any single acting pump apply the following rule-

Square the diameter (in inches) of the cylinder, multiply this by .7854, and the result (which is the area of the circle of cylinder) by the length of stroke in inches. This gives the capacity in cubic inches per stroke (or revolution). Multiply this by the number of strokes per minute, and divide the product by 231 (the number of cubic inches in a gallon of water), and the result will be the capacity or amount of water the pump will discharge per minute. A double acting pump does duty at the forward and backward motion of the piston rod, and has double the capacity of a single acting pump.

## LIQUID OR WINE MEASURE.

Gill = 7.2187 cubic inches.

4 = 1 pint = 28.875 cubic inches.

8 = 2 = 1 quart = 57.75 cubic inches

32 = 8 = 4 = 1 gallon.

2016 = 404 = 252 = 63 = 1 hoghead

4032 = 1008 = 504 = 126 = 2 = 1 pipe.

8064 = 2016 = 1008 = 252 = 4 = 2 = 1 tun.

## TROY WEIGHT.

Grains

24 = 1 dwt

480 = 20 = 1 oz.

5760 = 240 = 12 = 1 lb. = 22.816 cubic inches of  
distilled water at 62° Fahrenheit.

## AVOIRDUPOIS WEIGHT.

Drachms.

16 = 1 oz. = 437.5 grains troy

256 = 16 = 1 lb. = 1.2153 lb troy.

6400 = 400 = 25 = 1 quarter

25600 = 1600 = 100 = 4 = 1 cwt

512000 = 32000 = 2000 = 80 = 20 = 1 ton.

NOTE.—The Standard Unit of Liquid Measure adopted by the United States Government is the Winchester wine gallon, which contains 231 cubic inches, and holds 8.339 pounds avoirdupois of distilled water, at its maximum density weighed in air, the barometer being at 30 inches



## WEIGHTS AND MEASURES.

Inches.	LONG. MEASURE.
12=	1 foot.
36=	3 = 1 yard.
72=	6 = 2 = 1 fathom.
198=	16.5 = 5.5 = 2.75 = 1 perch or rod.
792=	660 = 220 = 110 = 40 = 1 furlong.
63360=5280	=1760 = 880 = 320 = 8 = 1 mile.

## GUNTER'S CHAIN.

## NAUTICAL MEASURE.

## SOLID MEASURE.

Inches.	Nautical mile.	Cubic inches.
7.92=	1 link.	1728= 1 cubic foot.
792 =	100= 1 chain.	46656=27=1 cubic yard.
360 =	8000=80=1 mile.	
	3=	
	1=6086 feet.	
	3=	
	1=1 league.	
	60=	
	20=1 deg.=69.16 Eng. miles.	

## DECIMAL EQUIVALENTS OF INCHES, FEET AND YARDS.

Fractions of an inch.	Decimals of an inch.	Decimals of a foot.
$\frac{1}{16}$	=.0625	=.00521
$\frac{1}{8}$	=.125	=.01041
$\frac{3}{16}$	=.1875	=.01562
$\frac{1}{4}$	=.25	=.02083
$\frac{5}{16}$	=.3125	=.02604
$\frac{3}{8}$	=.375	=.03125
$\frac{7}{16}$	=.4375	=.03645
$\frac{1}{2}$	=.5	=.04166
$\frac{9}{16}$	=.5625	=.04688
$\frac{5}{8}$	=.625	=.05208
$\frac{11}{16}$	=.6875	=.05729
$\frac{3}{4}$	=.75	=.06250
$\frac{13}{16}$	=.8125	=.06771
$\frac{7}{8}$	=.875	=.07291
1	=.8833	=.0777
2	=.1666	=.0555
3	=.25	=.0833
4	=.3338	=.1111
5	=.4166	=.1389
6	=.5	=.1666
7	=.5833	=.1944
8	=.666	=.2222
9	=.75	=.25
10	=.8333	=.2778
11	=.9166	=.3055
12	=1.	=.3333

## DECIMAL EQUIVALENTS OF OUNCES AND POUNDS.

Ounces.	Pounds.	Ounces.	Pounds.
$\frac{1}{16}$	=.015625	64	=.4063
$\frac{1}{8}$	=.03125	7	=.4275
$\frac{3}{16}$	=.046875	7 1/2	=.4588
$\frac{1}{4}$	=.0625	8	=.5
$\frac{5}{16}$	=.09375	8 1/2	=.5313
$\frac{3}{8}$	=.125	9	=.5625
$\frac{7}{16}$	=.15625	10	=.625
$\frac{1}{2}$	=.1875	11	=.6875
$\frac{9}{16}$	=.21875	12	=.75
$\frac{5}{8}$	=.25	13	=.8125
$\frac{11}{16}$	=.2813	14	=.875
$\frac{3}{4}$	=.3125	15	=.9375
$\frac{13}{16}$	=.3438	16	=1.
$\frac{7}{8}$	=.375		

## USEFUL NUMBERS.

Lineal feet	..... x	.00019	=miles.
Lineal yards	..... x	.0006	=miles.
Square inches	..... x	.007	=square feet.
Square feet	..... x	.111	=square yards.
Square yards	..... x	.0002067	=acres.
Acres	..... x	.4840	=square yards.
Cubic inches	..... x	.00058	=cubic feet.
Cubic feet	..... x	.03704	=cubic yards.
Circular inches	..... x	.00546	=square feet.
Cylindrical inches	..... x	.0004546	=cubic feet.
Cylindrical feet	..... x	.02909	=cubic yards.
Links	..... x	.22	=yards.
Links	..... x	.66	=feet.
Feet	..... x	1.5	=links.
Width in chains	..... x	8.	=acres per mile.
183, 346 circular inches	.....		=1 square foot.
2200 cylindrical inches	.....		=1 cubic foot.
Cubic feet	..... x	7.48	=U. S. gallons.
Cubic inches	..... x	.004329	= " "
Cylindrical feet	..... x	5.874	= " "
Cylindrical inches	..... x	.003	= " "
U. S. gallons	..... x	.13367	=cubic feet.
"	..... x	.231	=cubic inches.
Cubic feet	..... x	.8036	=U. S. bushel.
Cubic inches	..... x	.000466	= " "
U. S. bushel	..... x	.0495	=cubic yards.
"	..... x	1.2446	=cubic feet.
"	..... x	2160.42	=cubic inches.
Cylin. ft. of water	..... x	6.	=U. S. gallons.
Lbs. avoirdupois	..... x	.009	=cwt. (112).
"	..... x	.00045	=tons (2240).
Cubic ft. of water	..... x	.625	=lbs. avoirdupois.
" ins.	..... x	.03617	= " "
Cylin. ft. of water	..... x	49.1	= " "
" ins.	..... x	.02842	= " "
13.44 U. S. gallons of water	.....		=1 cwt.
268.8 " " " "	.....		=1 ton.
1.8 cubic feet of water	.....		=1 cwt.
35.88 " " " "	.....		=1 ton.
Column of water 12 ins. high, 1 inch diameter	.....		=341 lbs.

## TABLE OF HORSE-POWER OF BELTING.

Horse-power which may be transmitted by open single belts to pulleys running 100 revolutions per minute, the diameters of the driving and driven pulley being equal.

The horse-power of double belts is  $\frac{1}{2}$  of that given in the table.

Diam. of Pulley in Inches.	Width of Belt, in Inches.													
	2	3	4	5	6	8	10	12	14	16	18	20	22	
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	
6	.44	.65	.87	1.09	1.31	...	...	...	...	...	...	...	...	
7	.51	.76	1.01	1.27	1.53	...	...	...	...	...	...	...	...	
8	.58	.87	1.16	1.45	1.75	...	...	...	...	...	...	...	...	
9	.65	.98	1.31	1.64	1.97	...	...	...	...	...	...	...	...	
10	.73	1.09	1.45	1.81	2.18	...	...	...	...	...	...	...	...	
11	.8	1.2	1.6	2	2.4	...	...	...	...	...	...	...	...	
12	.87	1.31	1.75	2.18	2.62	...	...	...	...	...	...	...	...	
13	.95	1.42	1.89	2.36	2.83	...	...	...	...	...	...	...	...	
14	1.02	1.52	2.02	2.53	3.05	...	...	...	...	...	...	...	...	
15	1.09	1.64	2.19	2.73	3.29	...	...	...	...	...	...	...	...	
16	1.16	1.74	2.32	2.91	3.48	...	...	...	...	...	...	...	...	
17	1.24	1.85	2.47	3.09	3.7	...	...	...	...	...	...	...	...	
18	1.31	1.96	2.62	3.27	3.92	...	...	...	...	...	...	...	...	
19	1.39	2.07	2.76	3.45	4.14	...	...	...	...	...	...	...	...	
20	1.45	2.18	2.91	3.64	4.36	...	...	...	...	...	...	...	...	
21	1.52	2.29	3.05	3.82	4.58	...	...	...	...	...	...	...	...	
22	1.6	2.4	3.2	4	4.8	...	...	...	...	...	...	...	...	
23	1.67	2.51	3.35	4.18	5.02	...	...	...	...	...	...	...	...	
24	...	...	3.5	4.4	5.2	7	8.7	10.5	12.2	14	16	17	19	
25	...	...	3.6	4.5	5.5	7.3	9.1	10.9	12.7	14.5	...	...	...	
26	...	...	3.8	4.7	5.7	7.6	9.5	11.3	13.2	15.1	...	...	...	
27	...	...	3.9	4.9	5.9	7.8	9.8	11.8	13.7	15.6	...	...	...	
28	...	...	4.1	5.1	6.1	8.1	10.2	12.2	14.3	16.3	...	...	...	
29	...	...	4.2	5.3	6.3	8.4	10.5	12.6	14.8	16.9	...	...	...	
30	...	...	4.4	5.4	6.6	8.7	10.9	13.1	15.3	17.4	19	22	24	
31	...	...	4.5	5.6	6.8	9	11.3	13.5	15.8	18	...	...	...	
32	...	...	4.7	5.8	7	9.3	11.6	14	16.3	18.6	...	...	...	
33	...	...	4.8	6	7.2	9.6	12	14.4	16.8	19.2	...	...	...	
34	...	...	4.9	6.2	7.4	9.9	12.4	14.8	17.3	19.8	...	...	...	
35	...	...	5.1	6.4	7.6	10.2	12.7	15.3	17.9	20.4	...	...	...	
36	...	...	5.2	6.5	7.8	10.5	13.1	15.7	18.3	20.9	24	26	29	

TABLE OF HORSE-POWER OF BELTING—*Continued.*

Diam. of Pulley in Inches.	Width of Belt, in Inches.												
	2	3	4	5	6	8	10	12	14	16	18	20	22
	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.	H. P.
37	....	....	5.4	6.7	8.1	10.8	13.5	16.2	18.9	21.5	....	....	....
38	....	....	5.5	6.9	8.3	11	13.8	16.6	19.3	22.1	25	28	30
39	....	....	5.7	7.1	8.5	11.3	14.2	17	19.9	22.7	....	....	....
40	....	....	5.8	7.3	8.7	11.6	14.6	17.5	20.4	23.3	26	29	32
42	....	....	6.1	7.6	9.2	12.2	15.3	18.2	21.4	24.3	28	31	34
44	....	....	6.4	8	9.6	12.8	16	19.2	22.4	25.6	29	32	35
46	....	....	6.7	8.4	10	13.4	16	20.1	23.4	26.8	....	....	....
48	....	....	7	8.8	10.4	14	17.4	21	24.4	28	31	35	38
50	....	....	7.2	9	10.9	14.6	18.2	21.8	25.4	29	33	36	40
54	....	....	7.8	9.8	11.8	15.6	19.6	23.6	26.4	31.2	35	39	43
60	....	....	8.8	10.8	13.1	17.4	21.8	26.2	30.6	34.8	39	44	48
66	....	....	9.6	12	14.4	19.2	24	28.8	33.6	38.4	43	48	53
72	....	....	10.4	13	15.6	21	26.2	31.4	36.6	41.8	47	52	58
78	....	....	11.4	14.2	17	22.6	28.4	34	39.8	45.4	51	57	62
84	....	....	12.2	15.2	19.4	24.4	30.6	36.4	42.8	48.6	55	61	67

## HORSE-POWER OF GEARING.

The following table is for cast-iron gears, and is based upon a safety of 8 with ultimate tensile strength 30,000 pounds.

Speed of gear, 100 feet at pitch line.

Spur Gears. Horse-Power.	Pitch.	Face.	Bevel Gears. Horse-Power.
1.40	1	2½	1.01
2.52	1¼	3¼	1.78
3.84	1½	4	2.61
5.48	1¾	5	3.73
6.83	2	6	4.68
8.98	2¼	6½	6.39
10.70	2½	7	7.52
15.39	3	9	10.54

The horse-power of gears increases and decreases directly with the speed.

## DETACHABLE LINK BELTING.

## Approximate Horse-Power.

The following table gives the approximate horse-power transmitted by the different chains at 100 to 1,000 feet per minute, under average conditions. The estimates are conservatively made. Where resistance is uniform, and other conditions are favorable, it would be quite safe to figure on higher results. If, however, the chain be subjected to shocks, or there are other unfavorable conditions, proper allowance must be made.

Size.	Speed, in Feet per Minute.									
	100	200	300	400	500	600	700	800	900	1000
25	2	4	.6	.8	1	1.2	1.35	1.5	1.65	1.75
32	35	7	1	1.3	1.6	1.9	2.2	2.5	2.75	3
33	4	8	1.2	1.6	2	2.3	2.6	2.9	3.2	3.5
34	45	9	1.35	1.8	2.2	2.6	3	3.4	3.7	4
35										
42	5	1	1.5	2	2.5	2.9	3.3	3.7	4.1	4.5
45	55	1.1	1.65	2.2	2.7	3.2	3.6	4	4.4	4.8
51	.5	1	1.5	2	2.5	2.9	3.3	3.7	4.1	4.5
52	8	1.6	2.4	3.2	3.9	4.6	5.2	5.8	6.4	7
55	.75	1.5	2.25	3	3.75	4.4	5	5.5	6	6.5
57	1	2	3	4	4.7	5.4	6.1	6.8	7.4	8
62	1	2	3	4	4.7	5.4	6.1	6.8	7.4	8
66	1.2	2.4	3.6	4.8	5.8	6.7	7.6	8.3	8.9	9.5
67	1.3	2.6	3.9	5.2	6.3	7.3	8.2	9	9.8	10.5
75	1.4	2.8	4.2	5.6	6.7	7.7	8.7	9.6	10.5	11.4
77	1.5	3	4.5	6	7.25	8.5	9.5	10.5	11.25	12
78	1.75	3.5	5.25	7	8.5	9.75	11	12	13	14
88	2	4	6	8	9.75	11.25	12.75	14	15	16
103	3.5	7	10	12.5	15	17	19	20.5	22	23
114	4	8	12	15	17	19	21	23	25	27
124	4.5	9	13.5	17	20	22	24	26	28	30



## TRANSMISSION OF POWER BY WIRE ROPE.

The successful use of wire rope for power transmission purposes depends greatly upon the size of the sheaves, the speed of the rope and the distance apart of the shafts.

The table below will give some idea of the proper diameter of the sheaves to use, the average speed at which they should be run and the horse-power that will be developed.

The driving and driven sheaves should ordinarily be at least one hundred feet apart, although in some cases the drives are successful at fifty to one hundred feet.

We supply iron-wire rope with seven wires to the strand, and six strands, and recommend this rope as the best for transmission purposes.

For price list of rope and sheaves.

Diam. of Sheaves in Feet.	No. of Revolu- tions.	Diam. of Rope.	Horse- Power.	Diam. of Sheaves in Feet.	No. of Revolu- tions.	Diam of Rope.	Horse- Power.
3	80	$\frac{3}{8}$	5			$\frac{1}{2}$	18
3	100	$\frac{3}{8}$	7	6	60	$\frac{3}{8}$	25
3	120	$\frac{3}{8}$	8	6	80	$\frac{1}{2}$	25
						$\frac{3}{8}$	30
4	60	$\frac{3}{8}$	6	6	100	$\frac{1}{2}$	30
		$\frac{1}{2}$	10			$\frac{3}{8}$	36
4	80	$\frac{3}{8}$	8	7	60	$\frac{3}{8}$	30
		$\frac{1}{2}$	12	7	80	$\frac{3}{8}$	36
4	100	$\frac{3}{8}$	10	8	60	$\frac{3}{4}$	40
		$\frac{1}{2}$	16	8	80	$\frac{3}{4}$	50
4	120	$\frac{3}{8}$	12	9	60	$\frac{3}{4}$	60
		$\frac{1}{2}$	18	9	80	$\frac{3}{4}$	75
				10	60	$\frac{3}{4}$	90
5	60	$\frac{1}{2}$	12	10	80	$\frac{3}{4}$	110
5	80	$\frac{1}{2}$	16	12	60	$\frac{3}{4}$	140
5	100	$\frac{1}{2}$	20	12	80	$\frac{3}{4}$	160

# **HORSE POWER TRANSMITTED BY MANILLA ROPES UNDER WORKING STRAIN AS BELOW GIVEN.**

Diameter Rope.	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	1 in.	1 $\frac{1}{8}$ in.	1 $\frac{1}{2}$ in.	1 $\frac{3}{4}$ in.	2 in.
Strain in pounds .....	78	115	200	312	450	615	800

Velocity of Rope in feet per minute	DIAMETER OF ROPE.						
	$\frac{3}{4}$ in.	$\frac{7}{8}$ in.	1 in.	1 $\frac{1}{8}$ in.	1 $\frac{1}{2}$ in.	1 $\frac{3}{4}$ in.	2 in.
1000.....	1 24	2 25	3 57	5 59	8 02	10 85	14 20
9000.....	2 70	3 84	6 84	10 68	15 39	20 93	27 36
8500.....	3 30	4 71	8 38	13 10	18 86	25 66	33 54
8000.....	3 83	5 46	9 80	15 39	21 87	29 74	38 88
7500.....	4 30	6 23	11 09	17 33	24 94	34 03	44 35
7000.....	4 74	6 83	12 15	18 98	27 33	37 17	48 59
6500.....	5 01	7 24	12 89	20 15	29 00	39 45	51 57
6000.....	5 20	7 47	13 29	20 76	29 89	40 65	53 15
5500.....	5 29	7 60	13 53	21 14	30 43	41 39	54 13
5000.....	5 08	7 32	13 10	20 36	29 32	39 77	52 12
4500.....	4 74	6 83	12 13	19 00	27 34	37 21	48 63
4000.....	4 12	5 93	10 54	16 47	23 72	32 26	42 13
3500.....	3 25	4 67	8 32	13 00	18 73	25 42	33 23

Note that rope under the strains as above given will transmit the maximum power at a speed of 5500 revolutions per minute.

## CAPACITY OF ELEVATORS

In bushels of grain per hour, with pulleys of usual size and speed:

Size of Bucket.	Distance Apart, Center to Center, Inches.	Diameter of Head Pulley, Inches.	Speed of Head Shaft, Revolutions Per Minute.	Speed of Belt, Feet Per Minute.	Capacity, Bushels Per Hour.
2 × 2	10	16	48	200	28
2½ × 2½	10	16	48	200	50
3 × 3	10	18	45	215	88
3½ × 3	10	18	45	215	98
4 × 3	12	20	42	220	140
4½ × 3½	12	20	42	220	198
5 × 4	12	20	42	220	264
5½ × 4	12	24	40	250	350
6 × 4	12	24	40	250	430
7 × 4½	12	24	40	250	614
8 × 5	12	30	38	300	974
9 × 5½	16	30	38	300	1,216
10 × 5½	16	36	36	340	1,637
11 × 6	16	40	34	360	2,309
12 × 6½	16	40	34	360	2,820
14 × 6½	16	48	32	400	3,134
16 × 6½	16	48	32	400	4,454
18 × 7	16	54	31	440	6,393
20 × 7	16	60	30	470	7,450

The above table of capacity applies only to the Avery seamless steel buckets, which, owing to their peculiar shape, take a full load and discharge perfectly.

In figuring capacity of ordinary buckets a deduction of about 10 per cent should be made.

The size of pulleys and speed of belts given above are intended only to cover the average practice as to these items. With larger pulleys a greater belt speed may be used with satisfactory discharge of the buckets and with increased capacity.

### Area of Circles and their Circumference.

To find the Circumference of a Circle: Multiply the diameter by 3.1418, the product will be the circumference.

To find the Area of the body of a Cylinder: Multiply the diameter by 3.1418, and this sum by the length, and divide by 144; the quotient will be the area in square feet. Example: A cylinder 36 inches in 36x3.1418x36=4071.5136—144=28.1866 square feet.

Diameter	Area	Circle	Diameter	Area	Circle	Diameter	Area	Circle	Diameter	Area	Circle
1	0.0123	.3926	10	78.54	31.41	30	706.86	94.24	65	3318.3	204.2
1	0.0491	.7854	11	86.59	32.98	31	754.76	97.38	66	3421.2	207.3
1	0.1104	1.178	12	95.03	34.55	32	804.24	100.5	67	3525.6	210.4
1	0.1963	1.570	13	103.86	36.12	33	855.30	103.6	68	3631.6	213.6
1	0.3067	1.963	14	113.09	37.69	34	907.92	106.8	69	3739.2	216.7
1	0.4417	2.356	15	122.71	39.27	35	962.11	109.9	70	3848.4	219.9
1	0.6013	2.748	16	132.73	40.84	36	1017.8	113.0	71	3959.2	223.0
1	0.7854	3.141	17	143.13	42.41	37	1075.2	116.2	72	4071.5	226.1
1	0.9940	3.534	18	153.93	43.98	38	1134.1	119.3	73	4185.3	229.3
1	1.227	3.927	19	165.13	45.55	39	1194.5	122.5	74	4300.8	232.4
1	1.484	4.319	20	176.71	47.12	40	1256.6	125.6	75	4417.8	235.6
1	1.767	4.712	21	188.69	48.69	41	1320.2	128.8	76	4536.4	238.7
1	2.078	5.105	22	201.06	50.26	42	1385.4	131.9	77	4656.0	241.9
1	2.405	5.497	23	213.82	51.83	43	1452.2	135.0	78	4778.3	245.0
1	2.761	5.890	24	226.98	53.40	44	1520.5	138.2	79	4901.6	248.1
2	3.141	6.283	25	240.52	54.97	45	1590.4	141.3	80	5026.5	251.3
2	3.976	7.068	26	254.46	56.54	46	1661.9	144.5	81	5153.0	254.4
2	4.908	7.854	27	268.80	58.11	47	1734.9	147.6	82	5281.0	257.6
2	5.939	8.639	28	283.52	59.69	48	1809.5	150.7	83	5410.6	260.7
3	7.068	9.424	29	298.64	61.26	49	1885.7	153.9	84	5541.7	263.8
3	8.295	10.21	30	314.16	62.83	50	1963.5	157.0	85	5674.5	267.0
3	9.621	10.99	31	330.06	64.40	51	2042.8	160.2	86	5808.8	270.1
3	11.044	11.78	32	346.36	65.97	52	2123.7	163.3	87	5944.6	273.3
4	12.566	12.56	33	363.05	67.54	53	2206.1	166.5	88	6082.1	276.4
4	15.904	14.13	34	380.13	69.11	54	2290.2	169.6	89	6221.1	279.6
4	19.635	15.70	35	397.60	70.68	55	2375.8	172.7	90	6361.7	282.7
5	23.758	17.27	36	415.47	72.25	56	2463.0	175.9	91	6503.8	285.8
5	28.274	18.84	37	433.73	73.82	57	2551.7	179.0	92	6647.6	289.0
6	33.183	20.42	38	452.39	75.39	58	2642.0	182.2	93	6792.9	292.1
6	38.484	21.99	39	471.43	76.96	59	2733.9	185.3	94	6939.7	295.3
7	44.178	23.56	40	490.87	78.54	60	2827.4	188.4	95	7088.2	298.4
7	50.265	25.13	41	510.93	80.11	61	2922.4	191.6	96	7238.2	301.5
8	56.745	26.70	42	531.55	81.68	62	3019.0	194.7	97	7389.8	304.7
8	63.617	28.27	43	552.82	83.25	63	3117.2	197.9	98	7542.9	307.8
9	70.882	29.84	44	574.73	84.82	64	3216.9	201.0	99	7697.7	311.0

### SOUND.

Velocity in Air.....per second, 1,142 feet.

" " Water....." 4,900 "  
 " " Iron....." 17,500 "  
 " " Copper....." 10,378 "

Wood....." 12,000 "  
 " " " "....." 16,000 "

Distant sounds may be heard on a still day—

Human voice.....150 yards  
 Rifle.....5,300 "  
 Military band.....5,200 "  
 Cannon.....35,000 "

### To Measure Distances by Sound.

RULE.—Multiply the time the sound takes in seconds by 1142; the product will be the distance in feet.

NOTE.—Sound in common air moves uniformly at the rate of about 1,142 feet in a second. Cold and uneven surfaces retard its motion a little, and heat accelerates it in a small degree.



# WEIGHTS OF ROUND AND SQUARE IRON.

PER LINEAL FOOT.

Size, in Inches.	● Weight, in Pounds.	■ Weight, in Pounds.	Size, in Inches.	● Weight, in Pounds.	■ Weight, in Pounds.
$\frac{1}{8}$	.093	.1184	$1\frac{3}{4}$	8.101	10.31
$\frac{3}{8}$	.1266	.1612	$1\frac{7}{8}$	9.3	11.84
$\frac{1}{4}$	.1653	.2105	2	10.58	13.47
$\frac{5}{8}$	.2093	.2665	$2\frac{1}{8}$	11.95	15.21
$\frac{5}{16}$	.2583	.329	$2\frac{1}{4}$	13.39	17.05
$\frac{11}{16}$	.3126	.398	$2\frac{3}{8}$	14.92	19
$\frac{3}{8}$	.372	.4736	$2\frac{1}{2}$	16.53	21.05
$\frac{13}{16}$	.4365	.5558	$2\frac{5}{8}$	18.23	23.21
$\frac{5}{8}$	.5063	.6446	$2\frac{3}{4}$	20.01	25.47
$1\frac{1}{8}$	.6613	.842	$2\frac{7}{8}$	21.87	27.84
$\frac{3}{4}$	.837	1.066	3	23.81	30.31
$1\frac{1}{8}$	1.033	1.316	$3\frac{1}{4}$	27.94	35.57
$\frac{7}{8}$	1.25	1.592	$3\frac{1}{2}$	32.41	41.26
$1\frac{1}{4}$	1.488	1.895	$3\frac{3}{4}$	37.2	47.37
$1\frac{3}{8}$	1.746	2.223	4	42.33	53.89
$\frac{7}{8}$	2.025	2.579	$4\frac{1}{4}$	47.78	60.84
$1\frac{5}{8}$	2.325	2.96	$4\frac{1}{2}$	53.57	68.2
1	2.645	3.368	$4\frac{3}{4}$	59.69	75.99
$1\frac{1}{8}$	2.986	3.803	5	66.13	84.2
$1\frac{1}{4}$	3.348	4.263	$5\frac{1}{4}$	72.91	92.83
$1\frac{3}{8}$	3.73	4.75	$5\frac{1}{2}$	80.02	101.9
$1\frac{1}{2}$	4.133	5.263	$5\frac{3}{4}$	87.46	111.4
$1\frac{5}{8}$	4.557	5.802	6	95.23	121.3
$1\frac{3}{4}$	5.001	6.368	$6\frac{1}{2}$	103.8	142.3
$1\frac{7}{8}$	5.466	6.96	7	129.6	165
$1\frac{1}{2}$	5.952	7.578	$7\frac{1}{2}$	148.8	189.5
$1\frac{9}{8}$	6.458	8.223	8	169.3	215.6
$1\frac{3}{4}$	6.985	8.893	$8\frac{1}{2}$	191.1	243.4

# WEIGHTS OF SHEETS OF IRON AND STEEL.

Weight in Pounds per Square Foot.

Thickness. In inches.	Iron. In Pounds.	Steel. In Pounds.	Thickness. In inches.	Iron. In Pounds.	Steel. In Pounds.
$\frac{1}{32}$	1.263	1.35	$\frac{11}{16}$	27.79	28.5
$\frac{1}{16}$	2.526	2.75	$\frac{3}{4}$	30.31	31
$\frac{3}{32}$	3.789	4	$\frac{13}{16}$	32.84	33.5
$\frac{1}{8}$	5.052	5.35	$\frac{7}{8}$	35.37	36
$\frac{5}{32}$	6.315	6.75	$\frac{15}{16}$	37.89	38.5
$\frac{3}{16}$	7.578	7.85	1	40.42	41
$\frac{7}{32}$	8.841	9.25	$1\frac{1}{16}$	42.5	43.5
$\frac{1}{4}$	10.1	11	$1\frac{1}{8}$	45	46
$\frac{9}{32}$	11.37	11.75	$1\frac{3}{8}$	47.5	48.5
$\frac{5}{16}$	12.63	13.5	$1\frac{1}{4}$	50	51
$\frac{11}{32}$	13.89	14.25	$1\frac{5}{8}$	52.5	53.5
$\frac{3}{8}$	15.16	16	$1\frac{3}{4}$	55	56.1
$\frac{13}{32}$	16.42	16.75	$1\frac{7}{8}$	57.5	58.65
$\frac{7}{16}$	17.68	18.5	$1\frac{1}{2}$	60.63	61.2
$\frac{15}{32}$	18.95	19.25	$1\frac{3}{4}$	70.73	71.4
$\frac{1}{2}$	20.21	21	$1\frac{7}{8}$	75	76.5
$\frac{9}{16}$	22.73	23.5	2	80.83	81.6
$\frac{5}{8}$	25.26	26			

## BIRMINGHAM GAUGE.

No. or Gauge.	Thickness. In Inches.	Weight.		No. of Gauge.	Thickness. In Inches.	Weight.	
		Iron.	Steel.			Iron.	Steel.
0000	.454	18.22	18.46	13	.095	3.81	3.86
000	.425	17.05	17.28	14	.083	3.33	3.37
00	.38	15.25	15.45	15	.072	2.89	2.93
0	.34	13.64	13.82	16	.065	2.61	2.64
1	.3	12.04	12.2	17	.058	2.33	2.36
2	.284	11.4	11.55	18	.049	1.97	1.99
3	.259	10.39	10.53	19	.042	1.69	1.71
4	.238	9.55	9.68	20	.035	1.4	1.42
5	.22	8.83	8.95	21	.032	1.28	1.3
6	.203	8.15	8.25	22	.028	1.12	1.14
7	.18	7.22	7.32	23	.025	1	1.02
8	.165	6.62	6.71	24	.022	.883	.895
9	.148	5.94	6.02	25	.02	.803	.813
10	.134	5.38	5.45	26	.018	.722	.732
11	.12	4.82	4.88	27	.016	.642	.651
12	.109	4.37	4.43	28	.014	.562	.569

## HORSE POWER OF SHAFTS.

We publish herewith a table which we have found in our experience to be a safe one to use in general practice for the transmission of power where shafts are properly supported.

When shafts are used for conveying power from one point to another without any of the bending strains of pulleys, gears, etc., the next smaller size may be used.

This table must not be confounded with tables of actual strength of shafts published by other authorities.

HORSE POWER OF SHAFTS FOR GIVEN DIAMETER AND SPEED.

Diameter of Shaft, Inches.	Revolutions per Minute.									
	100	125	150	175	200	225	250	300	350	400
1 $\frac{1}{8}$	2.4	3	3.6	4.2	4.8	5.4	6	7.2	8.4	9.6
1 $\frac{1}{4}$	4.3	5.4	6.5	7.6	8.6	9.8	10.8	13	15.2	17.2
1 $\frac{3}{8}$	6.5	8	9.7	11.2	13	14.6	16	19.4	22.4	26
1 $\frac{1}{2}$	10	12.5	15	17.5	20	22.5	25	30	35	40
1 $\frac{3}{4}$	14	17.8	21	24.5	28	31.5	35.6	42	49	56
2 $\frac{1}{8}$	20	25	30	35	40	45	50	60	70	80
2 $\frac{1}{4}$	26.5	32.5	40	44.6	53	58	65	80	89	106
2 $\frac{3}{8}$	34	42.5	51	59.5	68	76.5	85	102	119	136
2 $\frac{1}{2}$	54	67.5	81	94.5	108	122	135	162	189	216
3 $\frac{1}{8}$	80	100	120	140	160	180	200	240	280	320
3 $\frac{1}{4}$	114	142.5	171	199.5	228	256.5	285	342	399	456
4 $\frac{1}{8}$	156	195	234	273	312	351	390	468	546	624
4 $\frac{1}{4}$	208	260	312	364	416	468	520	624	728	832
5 $\frac{1}{8}$	270	337.5	405	472.5	540	607.5	675	810	945	1,080
5 $\frac{3}{8}$	340	425	510	595	680	765	850	1,020	1,190	1,360
6 $\frac{1}{8}$	420	525	630	735	840	945	1,050	1,260	1,470	1,680
8	640	800	960	1,120	1,280	1,440	1,600	1,920	2,240	2,560

It is well to say, in this connection, that no matter what general rules are adopted there are frequently special cases in which the engineer or designer must depart from his rules, and use his judgment in determining both the size of the shaft and the number and location of bearings.

## OUR ENGINEERING DEPARTMENT

Selected the Illustrations  
on the Following Pages From

### **“MECHANICAL MOVEMENTS”**

BY GARDNER D. HISCOX, M. E.

BY PERMISSION OF NORMAN W. HENLEY & CO.

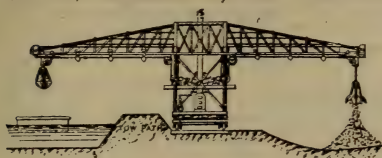
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The selection includes the most popular mechanical movements employed in general machine work.

To those having charge of machinery we would recommend a careful study of these pages at least once a month. By doing so you will get a great many ideas which can be applied in your business which will pay you for the time expended. The Useful Information on the eleven preceding pages will no doubt be of considerable value as reference. If you cannot get information or ideas from pages above mentioned, we will be pleased to furnish you further information through our Engineering Department.



CANTILEVER HOISTING AND CONVEYING MACHINE, "Lancaster" system. The trussed booms and standing



frame revolve on rollers on the truck. The truck moves on rails. The buckets swing with the truss booms for loading and discharging.



TIMBER SPLICING.—The straight splice bolted.



TIMBER SPLICING.—The lap splice with iron keys and bolts.



TIMBER SPLICING.—The lap splice with oak keys and yoke straps.



TIMBER SPLICING.—A scarf and butt joint with one fish plate, bolted.



TIMBER SPLICING.—The scarf and butt splice with iron fish plates, bolted.



TIMBER SPLICING.—A lap and scarf butt joint, keyed with oak and locked with anchor fish plate and bolts.



TIMBER SPLICING.

—Butt joint with timber fish plate, keyed and bolted.



TIMBER SPLICING.

—Butt joint with double timber fish plates, bolted.



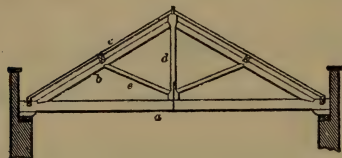
TIMBER SPLICING.—

Compression beams butted and held by a fish plate and bolts.



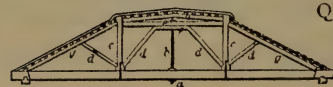
TIMBER CHORDS AND ARCHES.

—Splicing by breaking joints and bolting.



TRUSS ROOF.

*a*, tie beam.  
*b*, principal rafter.  
*c*, common rafter.  
*d*, king post.  
*e*, strut.



QUEEN POST ROOF TRUSS.

*a*, tie beam; *c, c*, queen posts;  
*d, d*, braces; *e*, truss beam;  
*f*, straining piece; *g, g*, principal rafters; *h*, cambered beam; *b*, iron string bolt to support tie beam.



WOODEN ROAD BRIDGE TRUSS.

**ARCH TRUSS BRIDGE.**—The entire load is not supported by the wood or iron arch alone. The truss bracing is made to equalize the load by stiffening the arch and so to throw a compression strain upon the

chord, which is thickened in the middle.



### BRIDGE TRUSSES.

The "McCallum" inflexible arched truss. A wooden bridge.



"Howe" truss, with inclined end posts, vertical struts and bi-panel tie rods.



"Post" truss, vertical end posts with inclined struts from each end meeting at the centre.



Modification of the "Whipple" and "Warren" systems.



Modification of the "Whipple" and "Post" systems. The "Warren" bridge.



The "Fink" system. A railway deck bridge. No lower chord.



The "Bollman" system. A girder suspension. The top girder carries the compression load due to suspension.





DOUBLE KNOT.



BLACKWALL TACKLE HITCH.



FISHERMAN'S BEND HITCH.



ROUND TURN AND HALF HITCH.



CHAIN STOP for a cable.



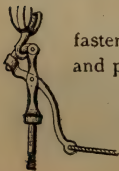
DISENGAGING HOOK, held by a mousing link.



SLIP HOOK.—The extension of the suspension link holds the lower link in line, while a pull on the arm by a lanyard releases the load.



RELEASING HOOK.—The lever throws the link off by a pull of the lanyard.



BOAT DETACHING HOOK.—The standard is fastened to the boat. A tongue is pivoted to its upper end and passes through the hook of the tackle-block. A lever with an eye to catch the tongue is pivoted to the upright standard, with a lanyard attached at the bottom. A simultaneous pulling of the two lanyards detaches both ends of a boat at once.





STEVEDORE KNOT



SLIP KNOT



FLEMISH LOO



BOWLINE KNOT.



CARRICK BEND.

SHEET BEND AND  
TOGGLE.

SHEET BEND. Weaver's knot.



OVERHAND KNOT.



FIGURE EIGHT KNOT.



BOAT KNOT.



FULL-RIGGED SHIP.—Square sails on fore, main, and mizzen mast, with a fore and aft sail on mizzen mast. Three jibs: 1, flying-jib; 2, jib; 3, foretopmast-staysail; 4, foresail; 5, mainsail; 6, cross-jacksail; 7, spanker; 9, foretopsail; 10, maintopsail; 11, mizzen topsail; 22, foretopgallant sail; 23, maintopgallant-sail; 24, mizzen topgallant-sail; 25, fore royal; 26, main royal; 27, mizzen royal.



ICE BOAT.—A sloop-rigged frame on three runners, the rear one being the tiller runner.

## ROPE KNOTS AND HITCHES.

CLOVE HITCH.



HALF-HITCH.

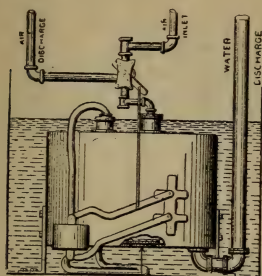


TIMBER HITCH.

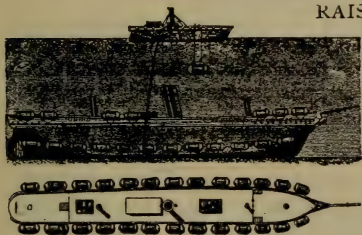


SQUARE OR REEF KNOT.



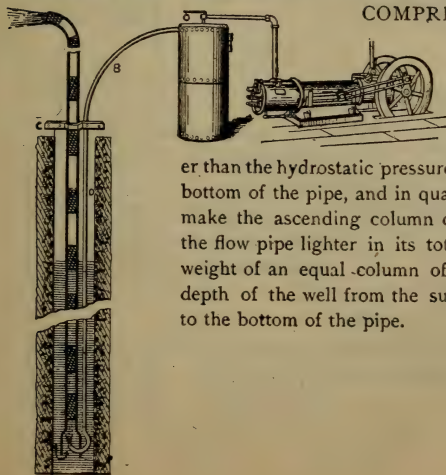


**COMPRESSED AIR WATER ELEVATOR.**—A tank is submerged in which there is a pivoted float that, by its raising and falling, operates a double-ported air valve for filling the tank, by discharging the air, and for discharging the water by the admission of compressed air. A single-flap valve at the bottom of the tank admits the water. The valve is thrown only at the top and bottom of the float stroke.



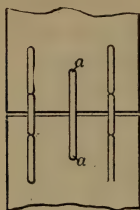
### RAISING SUNKEN VESSELS

by compressed air. Casks or bags fastened to the sides or placed inside of a vessel, and inflated with air under pressure, are used for raising sunken vessels.

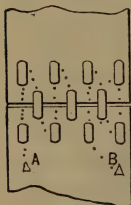


### COMPRESSED AIR LIFT

**SYSTEM** of pumping water from deep wells. The pressure in the air pipe must be greater than the hydrostatic pressure of the water at the bottom of the pipe, and in quantities sufficient to make the ascending column of air and water in the flow pipe lighter in its total height than the weight of an equal column of solid water of the depth of the well from the surface of the water to the bottom of the pipe.

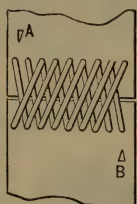
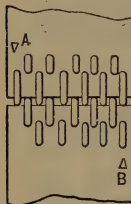


**BELT LACING**, for narrow belt. Commencing at *a, a* on the inside of belt 75, drawing the lacing to its centre; rove the ends each way, ending at *e, e*, 76.



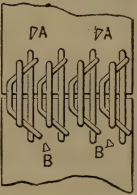
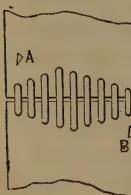
**BELT LACING**.—Commencing at *A* and ending at *B*. Dotted lines on outside.

**OVER-AND-OVER LACING**.—Commencing at *A* and ending at *B*. Diagonal on outside.



**INTERLOCKING BELT LACING**, from *A* to *B*, once across. A good style for small pulleys.

**CROSS LACING**, for a light belt.



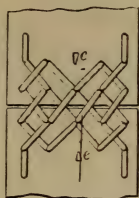
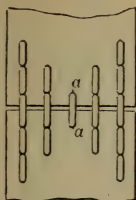
**OVER-AND-OVER LACING**, from *A* to *B*, diagonal outside.

**SECTIONAL BELT LACING**.—Each section disconnected, as shown, using four lacings.

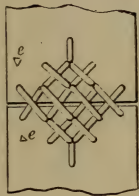
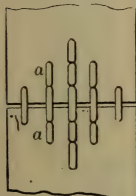


**QUARTER TWIST BELT**.—The arrows show the direction the belt should run.

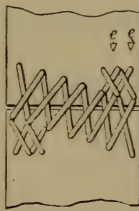
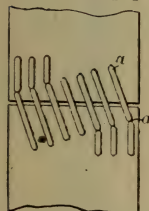




**BELT LACING.**—The straight lacing 65 should run next the pulley, while 66 represents the outside of the belt. Lace should be drawn in at *a, a*, to centre; lace each way out and return, ending at *e, e*, 66, on outside of belt.



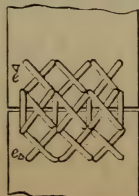
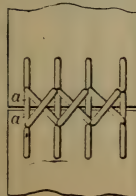
**BELT LACING.**—In this style the straight side should run next the pulley, drawing in the lace on one side at *a, a* to its centre, and lace across and back, ending at *e, e* on the outside of 68.



**NOVEL BELT LACING,** for quarter-turn belts. Draw lacing in to its centre at *a, a* on inside of belt, crossing on outside of 70, and ending at *e, e*, 70.

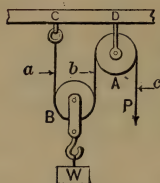


**BELT LACING,** for narrow belts. Draw in the lacing at *a, a* to its centre; lace each way and back to centre, ending on the outside of belt at *e, e*, 72.



**BELT LACING,** for medium width belts... Commencing at *a, a* on the inside of belt 73, drawing the lacing to its centre; rove each end once across, ending at the outside of belt 74 at *e, e*.

## TACKLE BLOCKS.



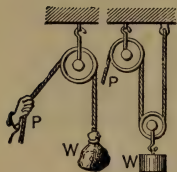
Two single sheaves.  $a, b, c$  are of equal strain.  $a + b = W$ . Sheave A only transfers the direction of P.

Simple sheave block.

$$P = W.$$

Two single sheave blocks—upper one fixed, lower movable.

$$P = \frac{W}{2}$$



Three single sheave blocks—one block fixed, two blocks movable.

$$P = \frac{W}{4}. \quad W = P \times 4.$$



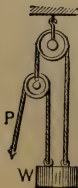
Three single sheave blocks, consisting of two fixed blocks and one movable block.

$$\text{Power: } P = \frac{W}{3}. \quad W = P \times 3.$$



One fixed sheave block, one movable sheave block.

$$P = \frac{W}{2}. \quad W = P \times 2.$$





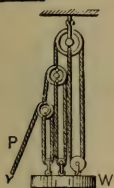
One fixed sheave block, two movable fixed blocks.

$$P = \frac{W}{4}, \quad W = P \times 4.$$



One fixed pulley block, three fixed rope ends.

$$P = \frac{W}{6}$$



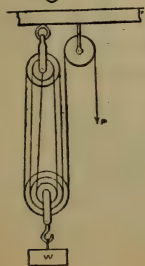
Multiple sheave blocks, all single.

$$P = \frac{W}{14}, \quad W = P \times 14.$$



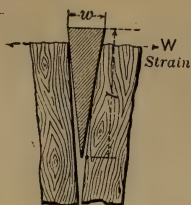
Four and three sheave blocks, with end of rope fixed to top block. Four sheave block fixed, three sheave block movable.

$$P = \frac{W}{6}, \quad W = P \times 6.$$



Roving of a three and two sheave pair of blocks, with a draw block fixed above.

$$P = \frac{W}{6}, \quad W = P \times 6.$$

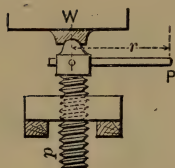


## THE WEDGE.

$$\text{Strain} = \frac{\text{force of blow} \times l}{w}$$

$l$ , length of wedge.

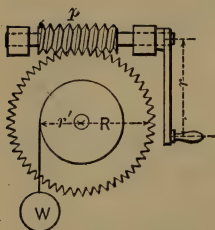
$w$ , width of wedge.



THE SCREW. All measures in equal units or inches.

$$W = \frac{P \times (2 \times r \times 3.1416)}{\text{Pitch of screw}}$$

$$P = \frac{W \times \text{pitch of screw}}{2 \times r \times 3.1416}$$



## WORM GEAR or ENDLESS SCREW.

$P$  = power.

$r$  = length of crank.

$R$  = radius of pitch line of gear.

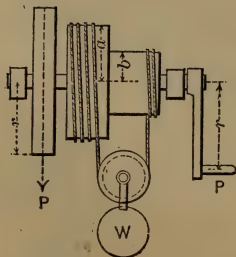
$p$  = pitch of screw.

$r'$  = radius of winding drum.

$$W = \frac{P \times r \times 6.28 \times R}{p \times r'}$$

$$P = \frac{W \times p \times r'}{6.28 \times r \times R}$$

$$\frac{W}{2} \text{ if screw is double-thread.}$$



CHINESE WHEEL, or differential axle, with crank or pulley.

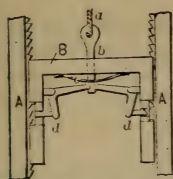
$a$  = radius large drum.

$b$  = radius small drum.

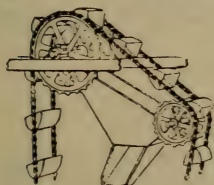
$$W = \frac{P \times r \times 2}{a - b}$$

$$P = \frac{W \times (a - b)}{r \times 2}$$

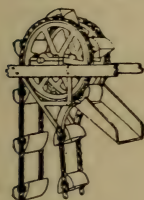




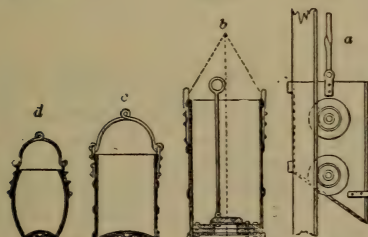
"OTIS STOP" for elevator cars. B car frame sliding on the ratchet posts A, A *d, d* are the stop-dogs operated by bell-crank levers to thrust the dogs into the ratchets on the release of the eye bar *b*, by a break in the rope or hoisting machine. The spring *c* quickens the operation of throwing out the dogs.



ELEVATOR DUMPING HEAD, showing method of inverting the buckets over a hopper spout.

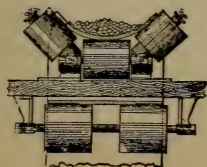


ELEVATOR DUMPING HEAD.—An inverted sector frame guides the bucket chain under the head wheel, which allows the buckets a clean discharge.

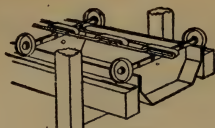


#### MINING BUCKETS AND SKIP.

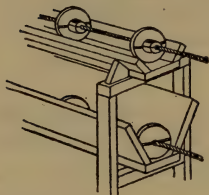
1220. *a*, Cornish kibble.  
 1221. *c*, Hooped straight bucket.  
 1222. *b*, Water bucket.  
 1223. *a*, Tram skip.



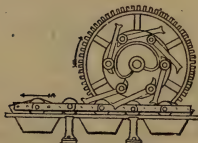
BELT CONVEYOR.—A series of horizontal and inclined rollers serve to turn up the edges of a belt, enabling the material carried to be retained on the belt; the belt returning on the horizontal rollers below.



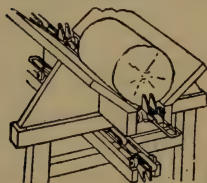
**CHAIN SCRAPER CONVEYOR.**—A chain supported on rollers and axles to which scrapers are fixed that fit the conveyor trough.



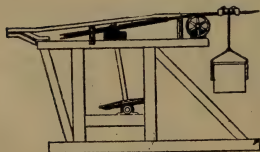
**CABLE CONVEYOR.**—Discs fixed to a cable running in a trough and returning overhead.



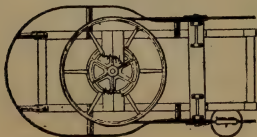
**DRIVING MECHANISM** for a coal or grain conveyor. "Hunt" model. The heart cam is fixed. The face plate carrying the pawls revolves with the driving gear. The cam guides the pawls to lock with the pins in the chain and lifts them again into position for their next push.



**LOG CONVEYOR.**—A link chain with hooks running in a trough.



**ROPE TRAMWAY,** overhead system. Elevation, showing the switch rails for transferring the carrier bucket around the terminal to the return rope. Loading or unloading of the bucket is done at the transfer switch.

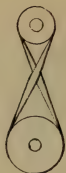


Plan showing the crossing of the switch rail over the carrier rope.

FULL TWIST BELT, or cross belt.

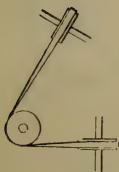


FULL TWIST OR CROSS BELT.  
for reverse motion on driven shaft.



BELTING TO A SHAFT AT ANY ANGLE.—

The two idler pulleys must be placed on a shaft at right angles to the driving and driven shafts, with their peripheries at the central line from centres from the driving and driven pulleys.

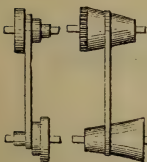


QUARTER TWIST RETURN BELT.—A method used for belting pulleys on shafts too close for a direct belt.



CHANGE SPEED STEP PULLEYS.—

Speeds are as the relative diameters of the driving and driven pulleys.



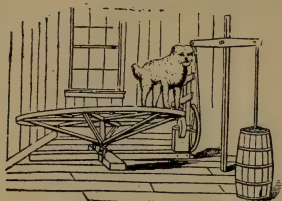
CONE PULLEYS.—The cone pulleys

allow of minute and continual change of speed by traversing the belt.



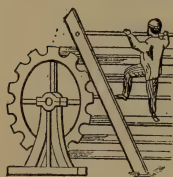
CURVED CONE PULLEYS, for variably increasing or decreasing speed by traversing the belt.





#### DOG-POWER MACHINE.

—The plane of the track wheel is set at an angle of about  $20^{\circ}$ , with its under edge bearing upon a friction pulley. Shaft and fly-wheel, with crank for operating churn.



**HUMAN TREADMILL.**—Still used in Eastern countries for raising water.



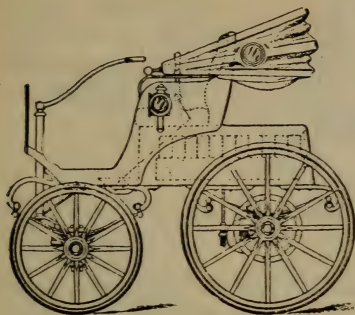
#### HORSE-POWER TREAD-WHEEL.

—One of the many designs for stationary animal power.

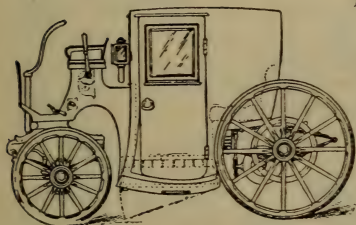


**HORSE-POWER MACHINE.**—An endless chain and rollers, with a slatted platform, roll over a sprocket-wheel driving shaft. The walking platform is elevated to an angle of about



**ELECTRIC PHAETON.—**

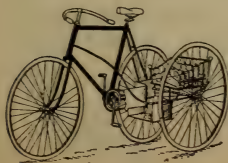
The motors are fixed to a frame under the floor of the phaeton, with their pinions meshing with an inside spur gear on each wheel. The batteries are under the seat and extension box over the driving wheels.

**ELECTRIC BROUGHAM.**

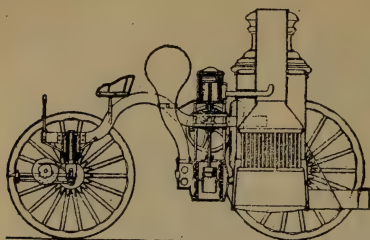
The same general arrangement of the motor as in No. 859, only that the batteries are stored under the floor.



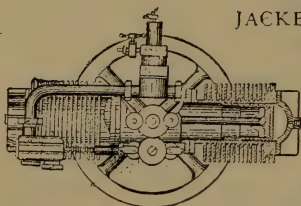
**DIFFERENTIAL GEAR.** for a tricycle. The bisected shaft is connected to a pair of pinions by universal joints. The pinions are pivoted at an angle of about  $30^\circ$  in a free-moving sleeve box.

**BABY-CARRIER TRICYCLE.**

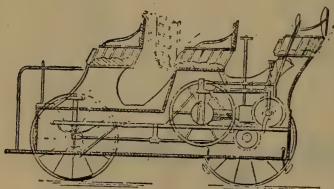
—An extension of the driving axle of an ordinary bicycle, with a supplementary wheel to balance and for safety, so that a convenient vehicle is made for carrying children or packages



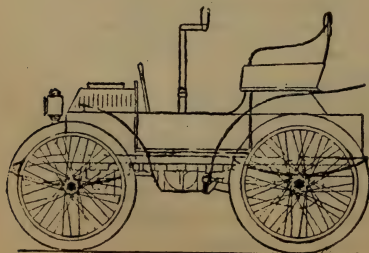
**STEAM FIRE ENGINE.** Vertical tubular boiler. Vertical steam pump, with yoke connection to fly-wheel crank. "Gould" pattern.



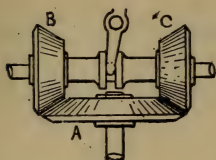
**JACKETLESS GASOLINE CARRIAGE MOTOR,** with two cylinders in line on two cranks at opposite points. Four-cycle type. Explosion in cylinders simultaneously, reducing vibration. Cylinder cooled by air circulation over the radial ribs.



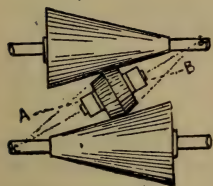
**GASOLINE MOTOR CARRIAGE.**—Two full seats and single seat for driver. The middle seat turns over to get at the motor and gear.



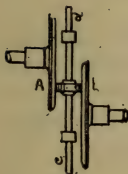
**LIGHT ELECTRIC CARRIAGE,** with single seat. The motor is attached to the frame and geared to a speed shaft, and by sprocket and chain to the wheel axle.



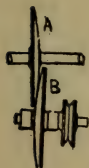
FRICITION GEAR, traversing motion. A, the driver. B and C are fast on the clutch sleeve which is free to slide on a feather on the driven shaft. The lever brings B or C in contact with the driving cone A for reversing



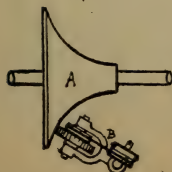
FRICITION GEAR. — Variable speed from a pair of cone pulleys, one of which is the driver. A double-faced friction pinion is moved on the line A, B in contact with both cones.



FRICITION GEAR.—A pair of friction discs A, B on parallel shafts out of line, with a traverse friction pinion on a transverse spindle c, d will give a great range of speed velocities.



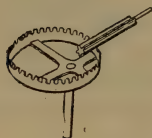
FRICITION GEAR.—Variable speed from a rocking shaft and convex discs. "Wright's" driving device for sewing-machines. A is the driving shaft with convex disc. B is a band shaft that swivels by the foot pedal and kept taut or released at its different positions.



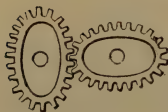
TRANSMISSION OF VARIABLE SPEED, for sewing-machines. A, driving concave cone. B, swivelling yoke carrying a friction pulley, with a band running a pair of pulleys at the swivel, one of which drives the sewing machine.



**GEARED GRIP TONGS.**—The radial distances of the sectors are in proportion to the diameters of the two pinions, which gives the jaws an equal motion, closing them with a strong grip by the action of the pinions.



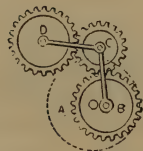
**VARIABLE CIRCULAR MOTION** by a pinion driving an eccentric crown wheel.



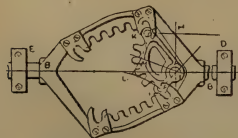
**ELLIPTICAL SPUR GEAR** for variable speed, the amount of which is governed by the relative lengths of the greater and lesser axes of the pitch lines of the elliptical gears.



**ELLIPTICAL GEAR WHEEL** and pinion for variable motion of a pinion from uniform speed of an elliptic gear. The pinion shaft is carried in a box in a slotted arm and held in contact by a spring or other means.

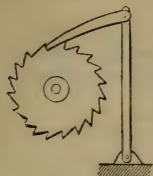


**IRREGULAR CIRCULAR MOTION** from a circular gear train. A, the driver, with a spur gear B, attached eccentrically; C, a pinion, and D, the driven wheel. The three pinions are connected with pivoted arms; then the swinging of the spur wheel B around its eccentric axis will give a variable motion to the wheel D.

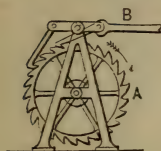


**VARIABLE RECIPROCATING MOTION** from a rotating spiral spur sector meshed in racks inclined to the line of motion. The pitch lines of the racks are curved to match the pitch line of the spiral sector. The pins F on the sector mesh with the stop jaws J, K, on the rack frame, alternately at each half revolution.





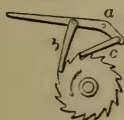
INTERMITTENT CIRCULAR MOTION, from a vibrating arm and pawl acting upon a ratchet wheel.



INTERMITTENT ROTARY MOTION of a ratchet wheel by lever and hook pawls.

B, vibrating lever.

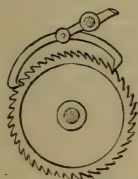
A, ratchet wheel.



DOUBLE-PAWL RATCHET.—The vibration of the lever *a*, with its pawls *b*, *c*, imparts a nearly continuous motion to the ratchet wheel.



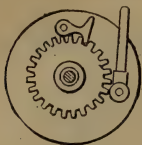
CONTINUOUS FEED OF A RATCHET by the reciprocating motion of a rod, two pawls on arms, and pivoted by links to the reciprocating rod.



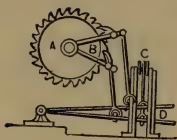
DOUBLE-PAWL RATCHET WHEEL.—The lever lifts the pawls, one of which moves the ratchet wheel at up-stroke by one pawl, and again at the down-stroke by the other pawl.



INTERMITTENT ROTARY MOTION, from a reciprocating rod and two pawls, acting on a ratchet-faced wheel. Arms C, C are loose on shaft of wheel A.



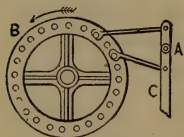
**INTERMITTENT CIRCULAR MOTION.**—Reversible by throwing over the double pawl. Operated by a reciprocating rod attached to the disc carrying the pawl.



**RATCHET INTERMITTENT MOTION,** by the operation of treadles. Pawl levers and pawls are operated through connecting rods to levers or treadles, the motion of which is made uniform by the strap and pulley attachment C.



**INTERMITTENT CIRCULAR MOTION**—Reversible by throwing over a double pawl on the vibrating bell-crank lever. A feed motion for planing machines.

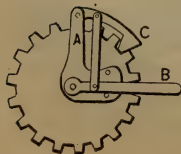


**INTERMITTENT ROTARY MOTION** of a wheel by vibrating levers and pawls.

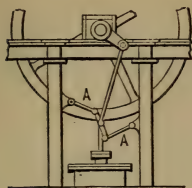
B, pin-tooth wheel.  
vibrating lever.



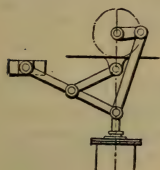
**INTERMITTENT CIRCULAR MOTION** from a reciprocating rod. Motion varied in the ratchet wheel A by the number of teeth swept over by the pawl B.



**PAWL LIFT.**—By moving the lever between the pins in the bell-crank pawl arm, the pawl is lifted and moved to new position without dragging over the teeth of the ratchet wheel.



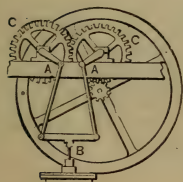
PARALLEL MOTION for a vertical engine. A, A, radius bars pivoted to engine frame opposite to the middle of stroke.



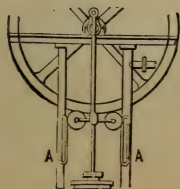
PARALLEL MOTION for an engine. The radius bars are of equal lengths from the centre line of the engine and sliding pivot of the long bar. Both fixed and sliding pivots at right angles with the centre line when at half stroke.



PARALLEL MOTION of a piston rod by direct connection with a spur gear rotating upon the wrist pin of the crank. The crank-pin gear meshes in a fixed internal toothed gear of double its diameter. One of the curiosities of old-time engineering.



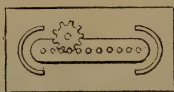
"CARTWRIGHT'S" PARALLEL MOTION for steam engines by geared wheels. A free cross-head on piston rod and connected to two cranks on shafts with equal spur gears from which power is transmitted through a third spur wheel. *Very old (1787).*



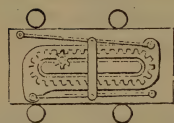
PARALLEL MOTION by a cross-head and rollers running against guide-bars. *Old.*



**MANGLE RACK**, guided by rollers and driven by a lantern half-pin. The long teeth in the rack act as guides to insure a tooth mesh at the end of each motion.



**MANGLE RACK**.—A reciprocating motion of a frame to which is attached a pin-tooth rack, the pinion being guided by the shaft riding in a vertical slot, not shown.



**MANGLE RACK** with stationary pinion. The rack and slot frame are jointed to the mangle box, riding in mesh with the pinion by the slot guide, leaving the mangle box free to ride and tip on the rollers.



**ALTERNATE CIRCULAR MOTION** from continuous motion of geared wheels. A grooved cam revolving with a geared wheel produces a variable or alternate motion to a crank, through a pin in the groove connected to the crank and to a fixed point by a connecting rod.



**MANGLE WHEEL** with equal motion forward and return. The pinion moves over the same teeth in both motions. The pinion moves vertical in a guide slot, not shown. The end of the shaft is guided vertically by the groove keeping the pinion teeth in mesh.



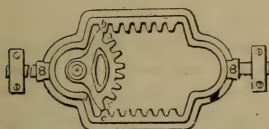
**"MANGLE WHEEL" GEAR** in the operation of which the speed varies in every part of its revolution. The pinion shaft is guided by the groove in the face of the wheel to keep the teeth in mesh, but rises and falls vertically by traversing a slotted guide, not shown.





### IRREGULAR CIRCULAR MOTION

from an elliptically eccentric gear train. C is the elliptic driving wheel turning with the shaft at D. B is the intermediate gear with a pinion follower to the eccentric gear C. A and B are attached by an arm pivoted on their respective shafts, so that B rises and falls to keep the gear in mesh.  $h$  and  $g$  is an elliptical slot in a plate attached to C, in which the end of the shaft of B traverses to keep the pinion B in gear with the elliptic wheel C.



### ALTERNATING RECTILINEAR

MOTION by the revolution of a sector by which one revolution produces both motions. The curved back of the sector just touches the extended tooth of the rack frame at  $a$ , while the teeth at  $c$  and  $b$  are partly in mesh with the enlarged sector end teeth, thus preventing back-lash or locking of the teeth.



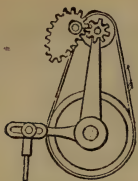
### INTERMITTENT MOTION OF SPUR

GEAR.—A is the driver. The pin J and the dog L are on the front side of the gear; the pin R and dog P are on the back. This class of gears may be made in varying proportion to suit the required stop motion of the gear B, A being the driver.



### INTERMITTENT MOTION OF SPUR

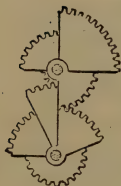
GEAR, in which the dogs G and F form a part of the driven gear B. This form allows of varying proportions of stop and speed motion in the two gears. A is the driving gear.



**VARIABLE VIBRATING MOTION** given to a rod, A, by the rotation of a pinion on an irregular-toothed wheel on a fixed axis; the pinion being carried by a bell-crank lever, with a variable slot adjustment.



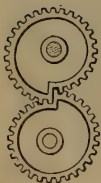
**MOTION BY ROLLING CONTACT** of elliptical half-gear wheels. The fork serves as a guide to enter the teeth into mesh.



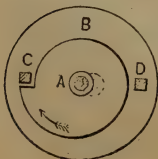
**VARIABLE SECTIONAL MOTION** from sector gears. The sectors are arranged on different planes, so that each pair shall be matched and all so adjusted that their teeth will mesh at their proper periods.



**UNIFORM SPEED OF SECTIONAL SPUR GEAR** during part of revolution. The motions varying suddenly according with the differential radii of the sectors.



**SCROLL GEARING.**— For increasing or decreasing the speed gradually during one revolution.



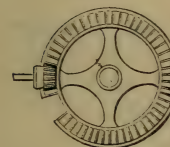
**INTERMITTENT ROTARY MOTION** from eccentric circular motion. C and D are pins concentric with wheel B. The shoulder cam A runs eccentric to the shaft of B, and catches the pin C or D at every revolution, turning B a half-revolution, and the reverse if B is the driver



**CONTINUOUS ROTARY MOTION** of a pinion producing reciprocating motion of the double-gear wheel carrying drum of a mangle. The slotted stand allows the pinion shaft to rise and fall, its end guided by the slot in the return-gear wheel to give the mangle drum a quick return.



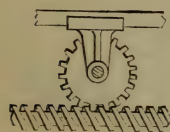
**MANGLE WHEEL** with grooved guides, uniform motion through nearly a revolution, and quick return.



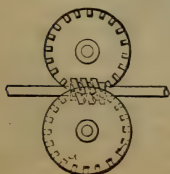
**MANGLE MACHINE GEAR.**—Large wheel is toothed on both faces. The pinion traverses from one side to the other of the geared wheel through the open space.



**WORM SCREW RACK.**—Continued motion of a worm screw meshed in a rack to produce motion in the rack from a fixed position of the worm, or with a fixed rack; the worm, sliding over a feather-key shaft, will drive sliding nuts holding a hoisting car or platform.



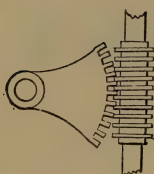
**ROTARY MOTION** of worm gear from an ordinary screw, or when the screw has great pitch, rotary motion of the screw may be obtained from the rotation of the worm-gear wheel.



**ADJUSTABLE FEED ROLLS** driven by worm gear. The roll gears have elongated teeth on their face meshing with the screw on each side, which allows of considerable variation of the depth of feed.



CIRCULAR RACK and pinion gear. A variable thrust bearing.



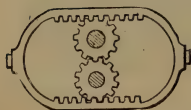
RECTILINEAR VIBRATING MOTION of a spindle having an endless worm gear, moved by a spur-gear sector.



VERTICAL DROP<sup>r</sup> HAMMER or impact rod, in any position. Continual motion of sector pinion lifts or draws back the rack-rod B, which quickly drops or springs forward on the release of the teeth.



SECTOR PINION AND DOUBLE RACK.—Rectilinear reciprocating motion from the continual motion of a sector pinion.

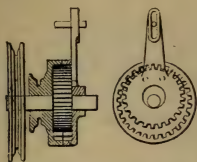


RECIPROCATING MOTIONS of two pinions, geared together and to opposite racks, producing rectilinear reciprocating motion to the racks, or *vice versa*.



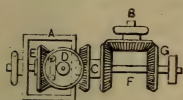
CRANK SUBSTITUTE, "Parson's" patent. A reciprocating double rack alternately meshing in a pinion. A cam face plate running in smooth ways in the racks and fast to the pinion lifts the racks into and out of gear alternately at the end of each stroke. The end teeth keep the pinion in mesh.





DIFFERENTIAL GEAR, section.

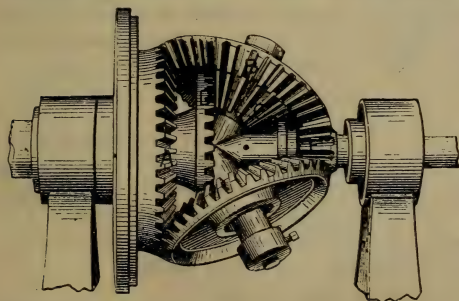
Plan. Used in differential pulley blocks. The cam and large grooved pulley are fixed on the shaft, the revolution of which swings the small gear in mesh with the larger internal gear, and rotating the large gear, shell, and the chain lift pulley, with a speed due to the difference in the number of teeth in the gears.



DOUBLING THE NUMBER OF REVOLUTIONS on one shaft. B, driving shaft and bevel wheel; G, bevel wheel fast on shaft F; C, two bevel wheels on hollow shaft running on shaft F; A, frame fast on shaft F, and carrying bevel wheel D; E, bevel wheel running loose on shaft F.

Revolution of B gives contrary and equal motions to shaft F and double-bevel wheel C. Frame A and its bevel wheel D, revolving in contrary direction to C, doubles the speed of bevel wheel E.

MULTIPLE GEAR SPEED in line of shaft. Pinion E is fast on small shaft. B and C are fast together and pivoted on the sleeve which runs loose on an extension of the small shaft gear; D is fast on the large shaft, and gear A is fixed to the bearing. Speed may thus be increased or decreased on a continuous line of shafting



by the relative number of teeth in the different bevel gears. When the multiple of the teeth in A and C is less than the multiple of the teeth in B and D, the gear D and the large

shaft will revolve forward or in the same direction as the pinion E. When the multiple of A and C is greater than the multiple of the teeth in B and D, the gear D and large shaft will revolve backward or in the opposite direction from the pinion E. The "Humpage" reducing gear

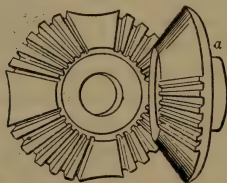


**SPIRAL STOP-MOTION GEAR.**— In this form a variable motion, in addition to the stop, is given to the driven wheel B. The dotted section at G shows the mesh of the spur, K, of the stop wheel. A is the driving wheel.

**FAST AND SLOW MOTION SPUR GEAR,** or a quick return when operating a slide motion by a crank. The driving gear



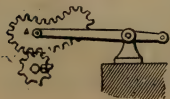
B is composed of gear sectors of differential radius to correspond with the sectors of the driven gear A. The horns and studs M, L are back of the face of the gears and make contact with the studs N and O, on the sector wheel A, guiding the wheels to mesh in the other pair of sectors.



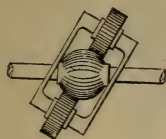
**MITER INTERMITTENT GEARS.**—The driver makes one revolution to one-quarter of a revolution of the driven gear. The blank part of the driving gear is milled down to the pitch line, and runs in the corresponding concave of the four-part driven gear.



**INTERMITTENT ROTARY MOTION.** From continuous rotary motion of a sector-toothed wheel. Part of the pinion is cut out of the same curve as the smooth part of the wheel, and acts as a stop until the pin on the wheel strikes the arm on the pinion and guides the contact of the teeth.



**IRREGULAR VIBRATORY MOTION** of an arm, A, from the rotary motion of a pinion, B



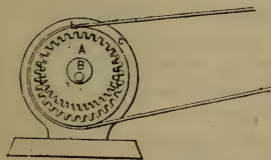
**BALL GEAR** with traverse pinions. Has a very limited traverse of the pinions.



**SPIRAL GEARING.**—V gearing, in which the teeth are at a small angle with the plane of rotation, makes a perfectly silent transmission of power.



**EXPANDING PULLEY.**—The sectional rim pieces with their arms have a radial sliding joint on the hub arms, and are moved out or in by pins projecting into the spiral slots on the central spur-gear wheel. The movement of the wheel *c*, by turning the ratchet pinion *d*, moves all the sections of the pulley equally.



**CONCENTRIC DIFFERENTIAL SPEED.**—B, high-speed shaft and eccentric on which the slow-speed gear A revolves with a differential motion by being carried around in mesh with the larger internal fixed gear C, giving a slow motion to the belt pulley B.



**DIFFERENTIAL MOTIONS** on concentric shafts by bevel gear.

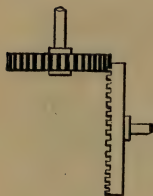


### INTERNAL SPUR GEAR and Pinion.—

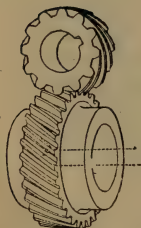
In this style of gearing more tooth surface is in contact than with outside teeth; it has less wear and great power. Much used in hoisting machines.



BEVEL GEARS, when of equal diameter.  
MITER GEARS, when of unequal diameter.



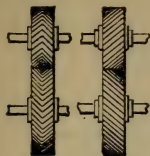
CROWN WHEEL geared with a spur wheel. Used for light work. A very old device.



SPIRAL GEARING.—The velocity ratio of spiral gears cannot be determined by direct comparison of pitch diameters, as in spur gearing, but must be found from the angles of the spiral in each gear. Thus if the spiral angles of two gears are the same the velocity ratio will be inversely as the pitch diameters; but if the spiral angles are not equal, the number of teeth per inch of pitch diameter will vary.

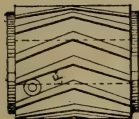
In any case the velocity ratio will depend upon the number of teeth and their spiral angle, as expressed in the following proportion:  $v$ , the velocity of the small gear is to  $V$ , the velocity of the large gear, as  $D$ , the pitch diameter of the larger,  $\times$  by the cosine of its spiral angle, is to  $d$ , the pitch diameter of the smaller,  $\times$  by the cosine of its spiral angle.



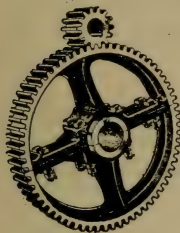


**V-TOOTHED GEARING.**—The obliquity of the teeth from the centre of the face neutralizes the longitudinal thrust of plain oblique teeth, as shown in the next pair.

**OBLIQUE TOOTH GEAR.**—A smooth running gear, with slight longitudinal thrust due to the inclined tooth surfaces.



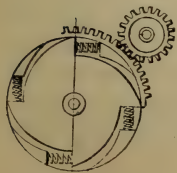
**V-TOOTHED GEAR.**—The teeth of which are usually inclined from the centre lines of the face equal to the amount of the pitch at the outer ends.



**SPLIT SPUR GEAR,** showing method of bolting on to the shaft of a trolley car.



**STAR WHEEL GEAR,** for wringing-machines, mangles, etc. Allows a variable mesh to the teeth.

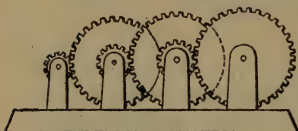


**ELASTIC SPUR GEAR,** to prevent back lash. The gear runs loose on the shaft; the ratchet-wheel is fast on the shaft. Compression springs are inserted between the shoulders of the gear and cam ratchet wheel.



**OBLIQUE SPUR AND BEVEL GEAR.**—An oblique tooth spur gear and an oblique bevel gear, operating shafts running at an angular position.

**OBLIQUE BEVEL GEAR** on shafts at right angles and crossing out of axial plane.



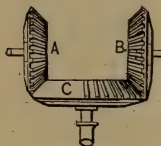
**GEAR TRAIN.**—Solution for increased speed: Divide the multiple of the number of teeth in the driving gears by the multiple of the number of teeth in the driven pinions, or the multiple of each pair separately may be multiplied by the multiple of the next pair. For decreasing speed, divide the ratios.



**WORM GEAR.**—With single thread the revolutions of the screw equal the number of teeth in the spur wheel for its revolution.



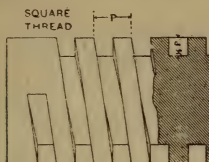
**SKEW WORM AND WHEEL GEAR.**—The angle of the teeth on this spur wheel must be equal to the angle of the screw shaft, less the angle of the screw at the pitch lines of both.



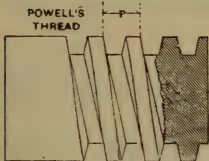
**UNIFORM INTERMITTENT MOTION** in opposite directions. The blank sector in the bevel wheel driver C interrupts the motion of A and B alternately



**VARIABLE SPEED BEVEL GEAR.**—A bicycle novelty. One revolution of A gives two revolutions of B. A is an elliptic bevel gear central on the shaft. B is an elliptic bevel gear of one-half the number of teeth of A and revolves on one of its elliptic centres. The cranks are set opposite to the short diameter of the driving gear A, giving greater power to the tread and quicker motion at the neutral points of the crank.



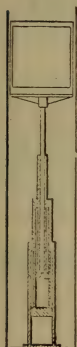
SCREW THREADS, square thread. Angle square. Depth equals  $\frac{1}{2}$  pitch. Width between threads equal  $\frac{1}{2}$  pitch, for clearance.



SCREW THREADS, "Powell's" thread. Depth of thread equals  $\frac{1}{2}$  pitch. Width of top of thread,  $0.37 - \text{of pitch}$ . Width of bottom,  $0.37 + \text{of pitch}$ . Angle of side,  $11\frac{1}{4}^\circ$ .



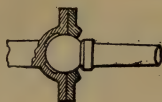
CONTINUAL BARREL ELEVATOR.  
—Sprocket wheels and link chains with curved arms to hold the barrels.



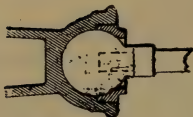
TELESCOPIC HYDRAULIC ELEVATOR.  
—The several piston cylinders take a proportional lift by their differential areas and balanced pressure areas in each compartment.



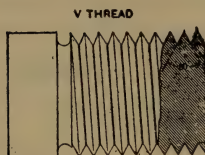
TRAVELLER HOIST, showing the principles of the balanced counter pull and the traverse tackle.



BALL SOCKET, used on surveyor's compasses. The gland is tightened with countersunk screws.

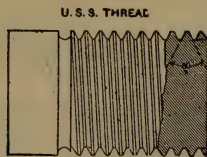


BALL SOCKET, with a screw gland.



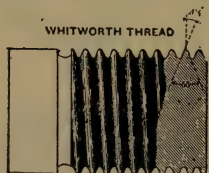
V THREAD

SCREW THREADS.—Standard V thread, sharp at top and bottom. Depth equals 0.85 of the pitch. Angle  $60^\circ$ .



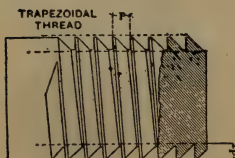
U. S. S. THREAD

SCREW THREADS.—United States Standard Thread. Flat top and bottom. Depth equals 0.65 of the pitch. Angle  $60^\circ$ .



WHITWORTH THREAD

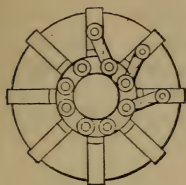
SCREW THREADS, "Whitworth" thread. Rounded top and bottom. Depth equals 0.75 of the pitch. Angle  $55^\circ$ .



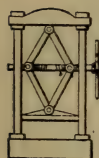
TRAPEZOIDAL  
THREAD

SCREW THREADS, Trapezoidal thread. Angle  $90^\circ$  face,  $45^\circ$  back. Depth equals 0.75 of the pitch.



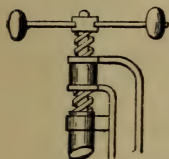


**TOGGLE-JOINT CAM MOVEMENT** for throwing out a number of grips at once by the local movement of the jointed ring.



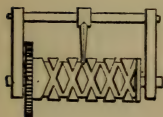
**DOUBLE-SCREW TOGGLE PRESS.—**

The screw has a right- and left-hand thread to draw the toggle joints together.

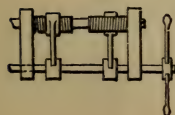


**SCREW STAMPING PRESS.—**

Rec-tilinear motion from the circular motion of the lever handles. The momentum of the balls gives the final power in this class of presses.



**MULTIPLE RETURN GROOVED CYLINDER**, producing extended rectilinear motion and return by its revolution. The carrier arm has a pivoted tracer to enable a smooth passage of the opposite grooves. A spooling device.

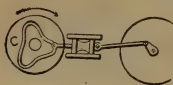


**RECIPROCATING RECTILINEAR**

**MOTION** by the alternate opening and closing of half nuts on a right and left screw. Nuts and arms are attached to a shaft that is thrown over by a dog on a spooling-frame shaft, locking the right- or left-threaded nut alternately.



**RECTILINEAR MOTION** by a right- and left-hand screw shaft driven by a worm gear. The nuts move on the right and left screw.



**IRREGULAR VIBRATING CIRCULAR MOTION**, from continuous circular motion of a cam slot. Any form of cam slot in a face plate may be made to produce a vibratory motion on a crank pin, which may be transmitted to circular or rectilinear motion.



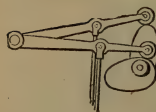
**CLOVER-LEAF CAM**, for rectilinear motion by follower rollers on a bar. The cam is so designed that the rollers have a bearing in all its positions.



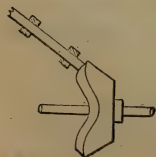
**POWER ESCAPEMENT** for heavy machines. The traverse bar may be vibrated by the positive motion of the cam arms.



**ROTARY MOTION** of a three-arm wiper produces a reciprocating rectilinear motion of the toothed frame, and *vice versa*.



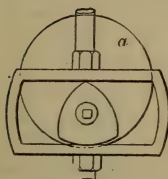
**IRREGULAR RECIPROCATING MOTION** of connecting rods and levers, moved by alternating oval cams.



**BEVELLED DISC CAM**, for variable reciprocating motion of a bar at an angle with the shaft.



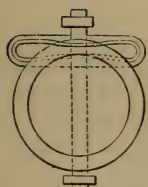
**TRIANGULAR CURVED ECCENTRIC**, which by its peculiar form makes a stop motion at each half-revolution of the cam, for any portion of the stroke, according to the length of the concentric portion of the cam.



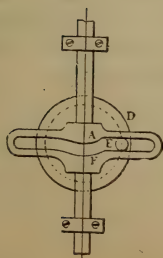
**TRIANGULAR ECCENTRIC** for producing a stop motion at each half-revolution of the face plate *a*, by the proportional peripheral length of the outer curve of the triangular cam. Used on a French engine.



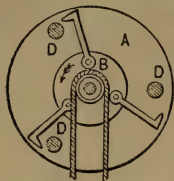
**RECIPROCATING MOTION** with four stops, two of which are of longer duration than the others. A pin on the rotating disc, sliding in a grooved yoke, may be made to give a variety of motions to the rectilinear slide by the form of the groove.



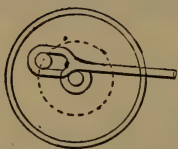
**UNIFORM RECIPROCATING MOTION** from the circular motion of a crank or disc wrist pin. The endless groove in the cross head is made to conform in shape to the varying rectilinear motion of the wrist pin.



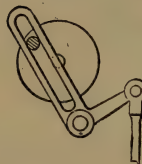
**NEEDLE-BAR SLOT CAM**, for sewing-machines. The depression in the pin slot gives the needle a stop motion while the shuttle passes.



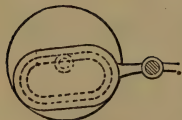
**CENTRIFUGAL SAFETY CATCH**  
for hoisting drums. The studs D, D, D are fixed to the hoisting drum frame. B is a flange fast to the drum shaft and to which is pinioned the safety hooks. At ordinary speed of the drum the hooks hang back so as not to touch the studs. An unusual acceleration of speed throws out the hooks to catch on the studs.



**STOP MOTION** from a wrist or crank pin. The relative amount of stop and motion depends upon the diameter of crank-pin circle and length of the connecting-rod slot, plus the diameter of crank pin. Used in brick machines.



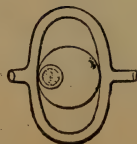
**VARIABLE RECIPROCATING MOTION**  
from the circular motion of a wrist pin on a disc crank. The pin sliding in the slot makes a quick return of the bell crank and connecting rod.



**IRREGULAR ROCKING MOTION**  
in an arm having an endless groove of any required shape, with the radius of the longitudinal axis equal to the radius of the pin. Pin not shown.

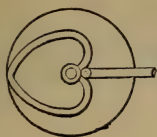


**ROCKING ARM** by cam groove. A groove in a face plate may be so designed as to give a variety of movement to a rock shaft, with an arm and pin follower.



**YOKE STRAP** and eccentric circular cam.

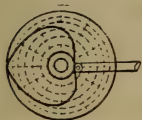




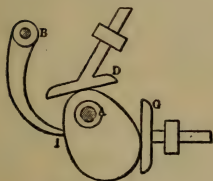
**GROOVED HEART CAM.**—The layout of a grooved cam may be made on the same principles as No. 1103, only that the centre of the roller or pin and the central line of groove are the measurements for the amount of motion.



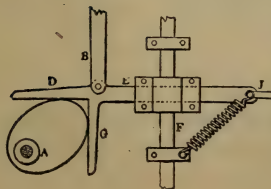
**HEART-SHAPED GROOVE** in a face plate, vibrating a lever, produces an irregular swinging motion of the lever.



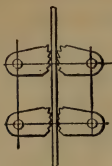
**LAYING OUT A HEART CAM.**—A circle is drawn on a radius equal to the required throw, plus the diameter of the roller. A series of concentric circles and radii enables a measured layout of the cam, which must be as much larger than the required motion as is equal to the radii of the roller on each radius of the plan.



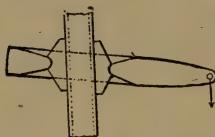
**CAM MOTION.**—Various applications of cam followers, with direct and oscillating motion.



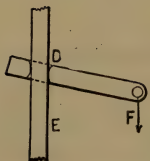
**DOUBLE-CAM MOTION,** from a sliding follower. The arm E of the follower, slides freely in the box, clamped to the vertical shaft, giving two equal motions at right angles.

**RECIPROCATING FEED RATCHET.**—

For an intermittent feed, one pair of jaws may have a reciprocating motion. For continual feed motion both pairs of jaws should have opposite reciprocating motions

**FRICTION ROD FEED RATCHET.**—

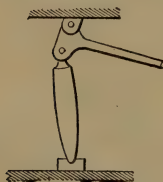
The jaws, being pivoted in a slot in a lever, make a powerful and quick grip on a feed bar by the motion of the lever bar.

**FRICTION HAULING RATCHET.**

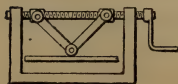
—A hole bored slanting through a bar D. A slot in the side of the bar, for convenience of putting on or taking off the rod or rope to be hauled, makes a handy clutching device.



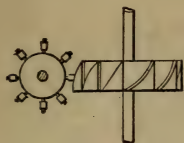
**CAM-LEVER GRIP** for a rope or rod stop. This principle is used on safety grips for elevators.



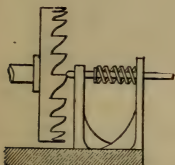
**LEVER TOGGLE JOINT**, largely used in stamping and punching presses. This form shows great pressure when the three bearings near a linear direction.



**SINGLE TOGGLE ARM LETTER PRESS.**—The arms are drawn together by right and left screw.



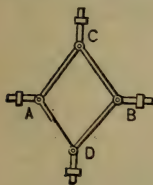
**INTERMITTENT ROTARY MOTION** from a shaft at right angles. The friction rollers on the horizontal shaft disc move in grooves or on projections from the wheel on the vertical shaft, producing a variety of intermittent motions, due to the form of grooves or projections.



**VIBRATING TOOTHED WHEEL.**—The rod is pressed against the teeth by the spring. A type of some electrical devices for interrupting the circuit.



**"LAZY TONGS" MOVEMENT.**—A system of crossed levers by which the amount of a rectilinear motion is increased by the proportional number of sections in the tongs. As a hand device it is in use as a toy, but is more useful as a reducing apparatus for a steam-engine indicator.



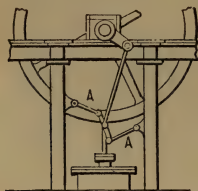
**QUADRANGULAR RECTILINEAR MOTION.**—Rectilinear motion given to any one of the arms A, B, C, or D gives a contrary motion to its opposite arm, and a contrary motion to each of the side arms.



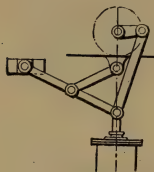
**PARALLEL MOTION**, in a vertical line, for a swinging bracket.



**INTERMITTENT MOTION** of a pin-tooth wheel by the half-revolution of a ring segment.



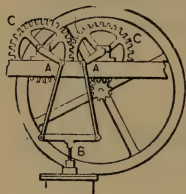
PARALLEL MOTION for a vertical engine. A, A, radius bars pivoted to engine frame opposite to the middle of stroke.



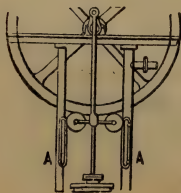
PARALLEL MOTION for an engine. The radius bars are of equal lengths from the centre line of the engine and sliding pivot of the long bar. Both fixed and sliding pivots at right angles with the centre line when at half stroke.



PARALLEL MOTION of a piston rod by direct connection with a spur gear rotating upon the wrist pin of the crank. The crank-pin gear meshes in a fixed internal toothed gear of double its diameter. One of the curiosities of old-time engineering.

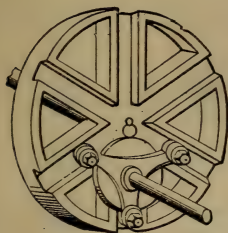


"CARTWRIGHT'S" PARALLEL MOTION for steam engines by geared wheels. A free cross-head on piston rod and connected to two cranks on shafts with equal spur gears from which power is transmitted through a third spur wheel. *Very old (1787).*

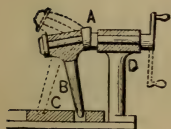


PARALLEL MOTION by a cross-head and rollers running against guide-bars. *Old.*

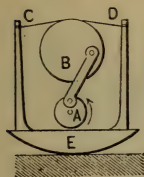




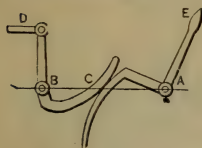
SIX RADIAL GROOVED TRAMMEL and triangular shaft arms, driving or being driven by a shaft out of line. The friction rollers give freedom of motion to either gear.



RECTILINEAR RECIPROCATING MOTION of a bar, from continuous circular motion of a bent shaft.



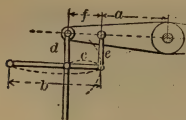
ROCKING MOTION, from a continuous rotary motion of the crank shaft A.



PAIR OF TOE LEVERS.— Bell-crank order. A and B, fulcrums of the levers; E, handle; C, curved toes. This principle is used as a valve gear.



WIPER CAM for stamp mills. A, the wiper; D, flanged chock, allowing the hammer spindle to revolve. Also in use on sewing-machines for throwing the needle bar.

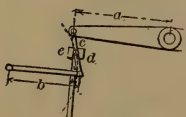


PARALLEL MOTION for beam engines, in which

$a$  and  $b$  are of equal length.

$c$  and  $f$  are of equal length.

$d$  and  $e$  are of equal length.

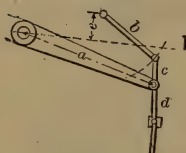


PARALLEL MOTION, with two pairs of connecting bars.

$a$  and  $b$  are of equal length.

$c$  and  $d$  are of equal length.

$e$ , cross-head.

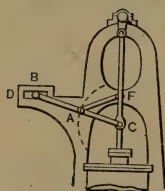


PARALLEL MOTION, with the radius bar pivoted above the centre line of the beam.

$c$  and  $d$  are of equal length.

$e = c$  or  $d$ .

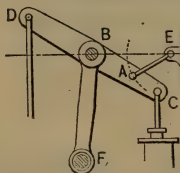
$b = \text{half } a$ .



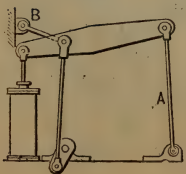
PARALLEL MOTION for a direct-acting engine. The radius bar, A, F, is pivoted to the frame on the centre line and at right angles to the slot, B.

A, C and A, F are of equal length.

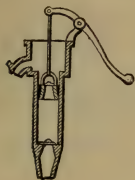
A, B and A, C are of equal length.



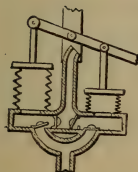
PARALLEL MOTION by a rocking beam. A, E and A, C are equal when E is pivoted in the centre line of motion of the piston rod.



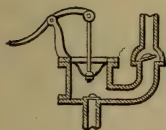
PARALLEL MOTION.—The "grass-hopper" movement of one of the early locomotives. B, the radius bar, pivoted in the centre line of motion of the piston rod; A, the rocker rod.



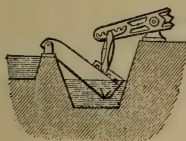
**LIFT PUMP.**—The limit of water lift in this pump is about thirty feet, but practically about twenty-five feet is its available working height.



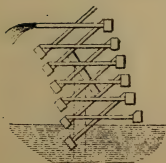
**DOUBLE-LANTERN BELLOWS PUMP OR BLOWER.**—A very ancient device for water and for a blower of air for forges. Will make a constant blast by using one side as a receiver, dispensing with the valves and connection on receiver side.



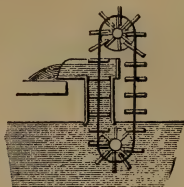
**DIAPHRAGM PUMP,** in which a flexible diaphragm is used instead of a piston.



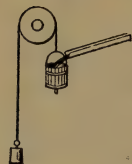
**"FAIRBURN" BAILING SCOOP,** for low-lift drainage or irrigation. The tilting scoop may be connected to a walking beam or directly to a vertical engine.



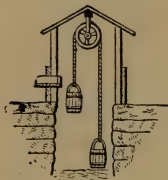
**PENDULUM WATER LIFT.**—A double series of scoops with flap valves and connecting pipes. The swinging of the pendulum frame alternately immerses the lower scoops, and at the next stroke raises the water by its transfer to the opposite scoop, when the next oscillation transfers to the next opposite scoop, and so on.



CHAIN PUMP—An old device for raising water, now in use in many modifications.



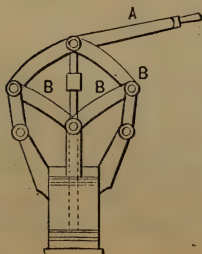
RECIPROCATING MOTION by the automatic action of a fall of water. A bucket with a valve in the bottom, which lifts and discharges the water by the contact of the valve spindle with a stop at the bottom of the bucket run; the weight lifting the bucket again to the spout. *Very old.*



WELL PULLEY AND BUCKETS.—Buckets are balanced empty.

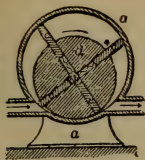


SWAPE, OR NEW ENGLAND SWEEP.—A very ancient as well as modern method of raising water from wells. The weighted end of the pole overbalances the bucket, so as to divide the labor of lifting the water.

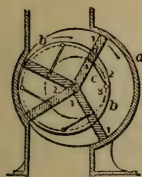


PARALLEL MOTION for double piston pump. A, The lever handle; links equal lengths.

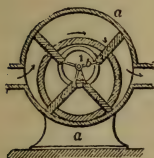




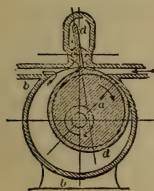
"RAMELLI" ROTARY PUMP.—One of the earliest (1588). A slotted cylinder with four wings eccentric to a cylindrical shell. The wings are pushed out by helical springs.



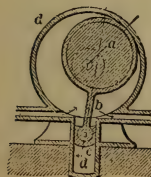
"HEPPEL" ROTARY PUMP.—Four wings are jointed concentric with the cylindrical shell. A disc and shaft are set eccentric to the cylindrical shell. The wings are linked to the eccentric disc as shown, so that the wings on the upward stroke move faster than the wings moving downward on the opposite side.



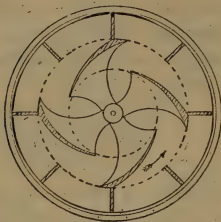
"EMERY" ROTARY PUMP.—Four wings driven by a hollow cylinder revolving eccentric to the outer shell. The inner ends of the wings are guided concentric with the outer shell by pins moving in a slot or groove in the shell heads, and kept in position by a toggle-joint connection.



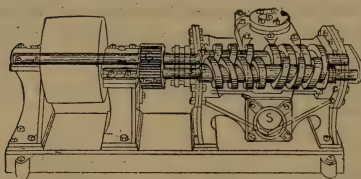
"KNOTT" ROTARY PUMP.—A hollow winged cylinder within which an eccentric revolves on an axis central with the shell, causing the winged cylinder to wipe the inner surface of the shell. The small slotted cylinder makes a packing for the wing.



"PATTISON" ROTARY PUMP.—A hollow winged cylinder in which an eccentric is rotated on an axis central with the outer shell. The piston and socket serve as a guide for the wing.

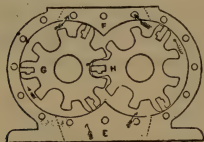


**"GOLDING" CENTRIFUGAL PUMP.**—Four volute blades are attached to the shaft by arms. To the outer case are attached radial blades with their edges nearly touching the revolving volute blades. Suction at centre; discharge at sides of outside shells.

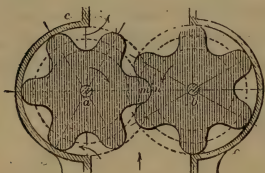


**"QUIMBY" SCREW PUMP.**—The screws revolve, meshed in each other, and are enclosed in a close-fitted case. Suction at each end from S, and discharge from the middle at D. End

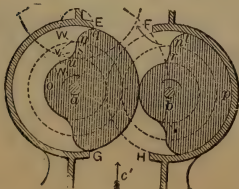
thrust is neutralized by the screws on each shaft being right- and left-handed.



**ROTARY PUMP, "Holley" system.** Similar in design to the steam engine, No. 342, only each piston has three long teeth meshing into the recesses of the opposite gear piston. Used in combination with No. 342 in the Silsby fire engine.



**"PAPPENHEIM" ROTARY PUMP.**—One of the earliest rotary devices for raising water. Two deep cog-wheels with their teeth meshed and rotating in a close-fitted shell.



**"REPSOLD" ROTARY PUMP.**—Two differential sector cylinders revolving in contiguous cylindrical shells. The greater and smaller sector surfaces match and alternately close the area between the centres of revolution.

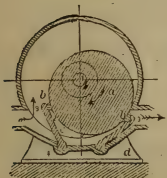
## ROLLER PISTON ROTARY ENGINE.

A rubber lining loosely placed within the cylinder is rolled over by the three-armed roller spider. E, E, rubber lining; B, spider on shaft; A, A, A, rollers.



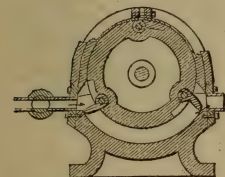
## "COCHRANE" ROTARY ENGINE.

—An eccentric cylindrical piston rotating on an axis central to the shell. The vibrating wings pivoted in the outer shell form the steam abutment by closing against the eccentric revolving cylinder.



## "BOARDMAN" ROTARY ENGINE.

—A cylinder revolving concentric with an outer segmental cylinder, with pockets containing swing pistons that open by centrifugal action at the steam inlet, making a steam abutment across the segment. The swing pistons are closed at the exhaust



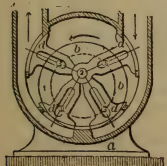
port by contact with the small segment of the outer cylinder.

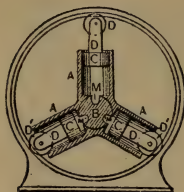
ROTARY ENGINE, with concentric shaft and wing barrel. The two wing slides pass through cylindrical rockers to give the slides a slight oscillating motion; slides are kept extended by pins traversing a circular slot concentric with the shell.



## "SMITH" ROTARY ENGINE.—

Four arms with cylindrical sectors are rotated around an axis central to a perforated cylindrical shell. The driven shaft and head discs are eccentric to the shell. The pressure of steam between the wings tends to push them apart, by which the differential leverage on the disc pins revolves the disc and shaft.

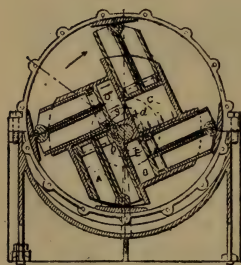




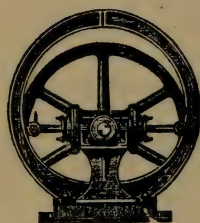
haust is opened and the piston is pushed back by the eccentric ring.

#### "RUTH'S" ROTARY ENGINE.—

A revolving cylinder engine. Three cylinders, A, A, A, radiate from a shaft set eccentric to an outer circle or ring on which the piston connected sheaves revolve. The pistons take steam through the ports M, M, M, just past the shortest eccentric radius, and drives out the piston during a half revolution, when the ex-



"ALMOND" ENGINE.—Four single-acting cylinders set tangent to a shaft which is central to an outer shell. The pistons have jointed segmental plates at their outer end that press against the outer shell and cause the cylinders and shaft to revolve by the eccentric direction of their pressure. Disc ports for steam and exhaust.



#### ROTATING CYLINDER ENGINE.—

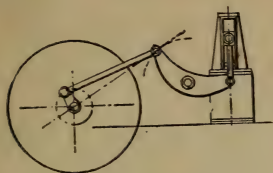
The cylinder rotates on trunnions with a through piston rod terminating with rollers running in an oval ring. Steam and exhaust ports in the trunnion. Pressure of the piston-rod rollers on the oval ring revolves the cylinder and fly-wheel on its runnion.



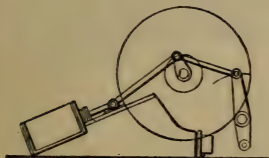
#### ROTARY MULTI-CYLINDER ENGINE.—

Three or more cylinders are attached to and revolve with the fly-wheel. The crank is stationary and eccentric to the fly-wheel. Each cylinder is single-acting. Valves are on a central disc at A.

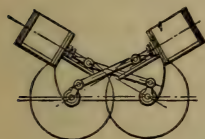




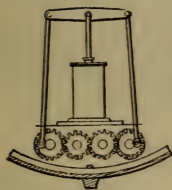
VERTICAL ENGINE, WITH  
BELL-CRANK LEVER, for stern-  
wheel boat.



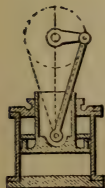
INCLINED PADDLE-WHEEL  
ENGINE, with upright crank-con-  
nected beam for driving air pump.



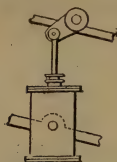
DIAGONAL TWIN-SKEW EN-  
GINE, arranged so that the connecting rods  
cross each other, thus economizing space.



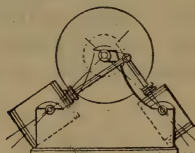
TWIN-SCREW VERTICAL CYLIN-  
DER ENGINE.—The outer gears are on the  
screw shafts; the inner gears are idlers to keep the  
beam even.



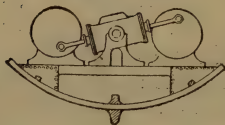
TRUNK ENGINE.—Does away with the  
slides and cross-head. It is also used for compounding  
by using the initial pressure at the trunk end and ex-  
panding beneath the piston.



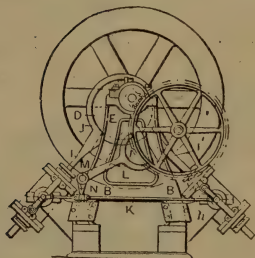
OSCILLATING ENGINE, with trunnions on middle of cylinder.



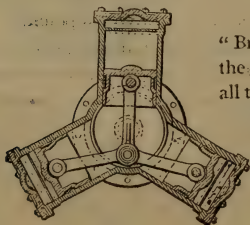
COMPOUND OSCILLATING ENGINE.—Cylinders at right angles.



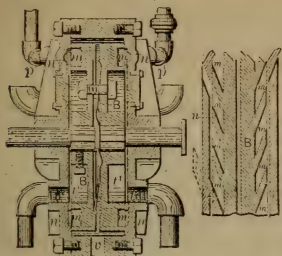
TWIN-SCREW OSCILLATING ENGINE.—A through piston rod connects directly to crank-pins on the shaft face plates. Suitable for small boats.



OSCILLATING HOISTING ENGINE.—The piston rods are attached to an eccentric strap; one fixed, the other pivoted. A lever operated by the same eccentric strap, through a short connecting rod, operates the valve gear of each cylinder alternately.

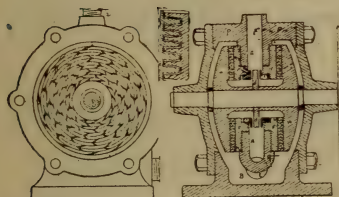


THREE-CYLINDER ENGINE, "Brotherhood" type. Steam is admitted to the central chamber with equal pressure on all the pistons. The rotary-disc valve is operated by the crank-pin, giving steam to the outside of the pistons alternately through an outside port to each cylinder. Main shaft bearing has a stuffing-box.



Section showing steam pockets.

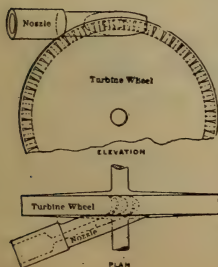
"WILKINSON'S" STEAM TURBINE.—Two rim-pocketed discs running against the disc surfaces of a shell with oblique steam ports. The discs are feathered on the shaft, and held against the faces of the shell by springs. A groove around the shell opposite the pockets allows the steam to pass around to the exhaust pipes.



the revolving discs are cut across at short distances in a slanting direction. The tongues on the stationary disc are cut in the opposite direction. The steam passes to the centre hub, and is forced through the openings across the tongues, giving motion to the discs and shaft.

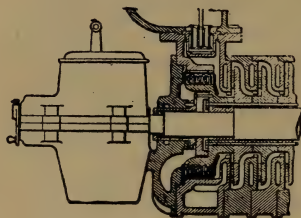
Vertical section of engine.

"DOW" STEAM TURBINE.—Two discs fixed to a shaft have on their face a series of circular grooves and tongues, meshed with a pair of fixed discs with grooves and tongues, as shown in small section 367. The tongues on



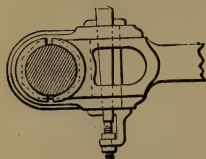
"DE LAVAL" STEAM TURBINE.—A jet or jets of steam impinge at a small angle upon the concave buckets at the periphery of a disc wheel, pass through the cavities between the buckets and exhaust at the other side. The buckets are lunette. The nozzle has an expanding orifice.

Plan showing nozzle at side of wheel.



"PARSONS'" STEAM  
TURBINE. — A series of discs  
fixed on a shaft with intersecting  
discs on the shell. The face of the  
shaft discs has several small blades  
set at an angle with the radius.  
The outside fixed disks have a sim-  
ilar set of blades interlocking with

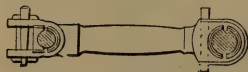
the revolving blades and set at a contrary angle. The steam passes  
from the valve to the inner edge of the first fixed disc, then outward  
through the blades, and returns through the vacant space of the next  
pair and outward again.



CONNECTING ROD END, with  
locknut key.



ADJUSTABLE LINK, with  
right and left screw coupling.

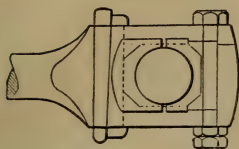


LINK OR CONNECTING  
ROD, with adjustable brasses. Keys  
inside and outside of pins.





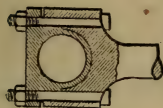
CONNECTING ROD HEAD, with full split brasses, held by cap and through bolts.



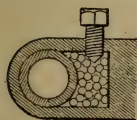
CONNECTING ROD END, with set-in end block.



SOLID STRAP END, for connecting rod. Brasses set up by a capstan screw.



CONNECTING ROD END, with half brass and brass cap. Through bolts.



STEEL BALL ADJUSTMENT for connecting rod brasses. A number of steel balls are enclosed in a chamber and compressed by a screw.



SOLID END CONNECTING ROD.—Brasses slip in sideways, and are locked in by the key.



FORKED END CONNECTING ROD, with keys and set screws

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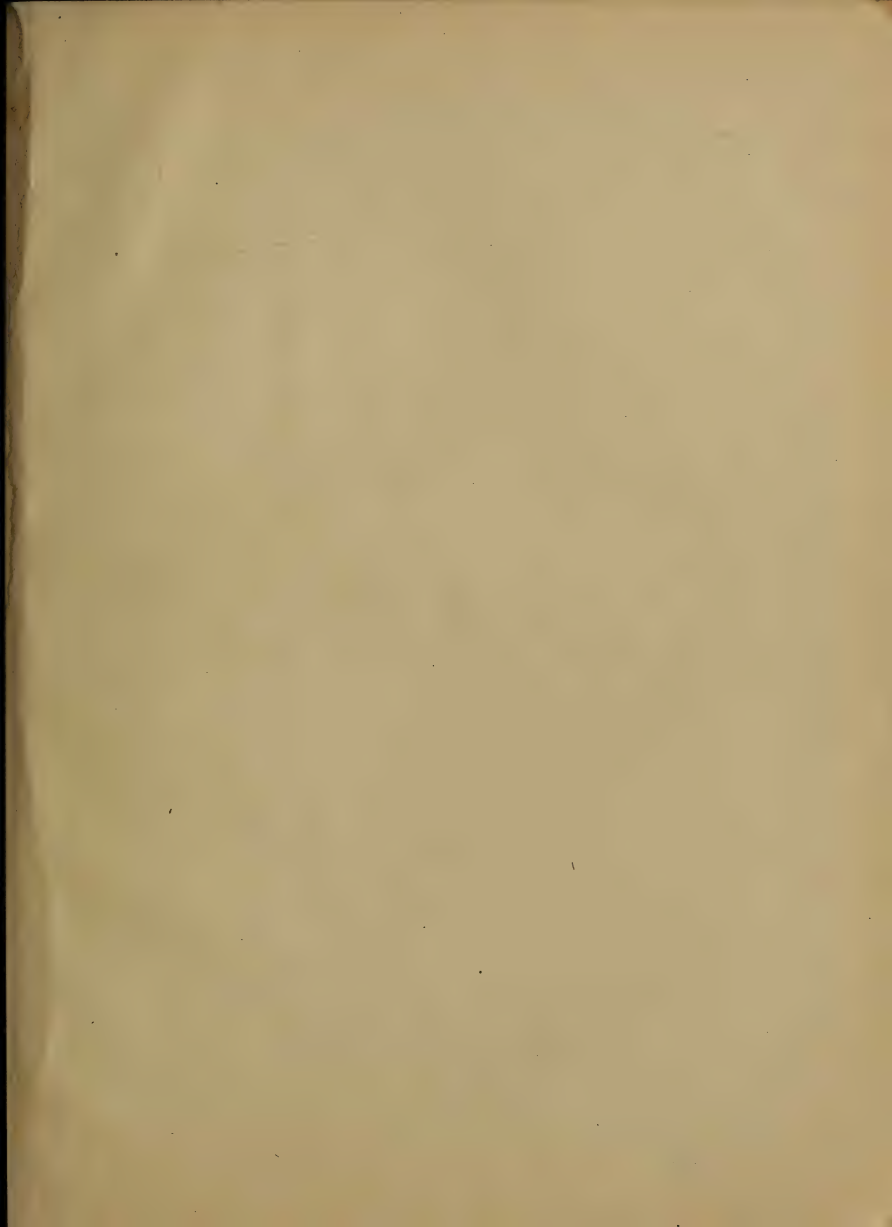
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Steel .....	200-201

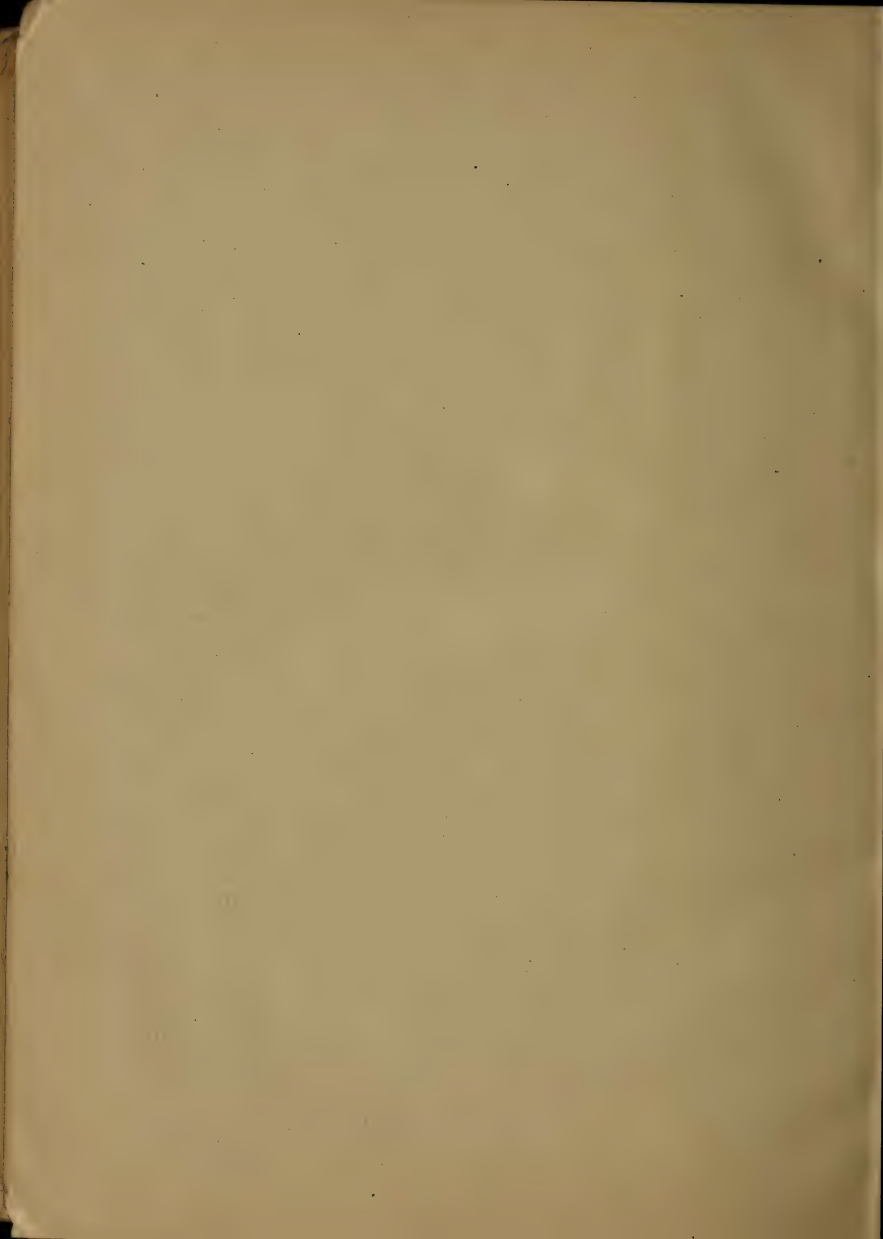


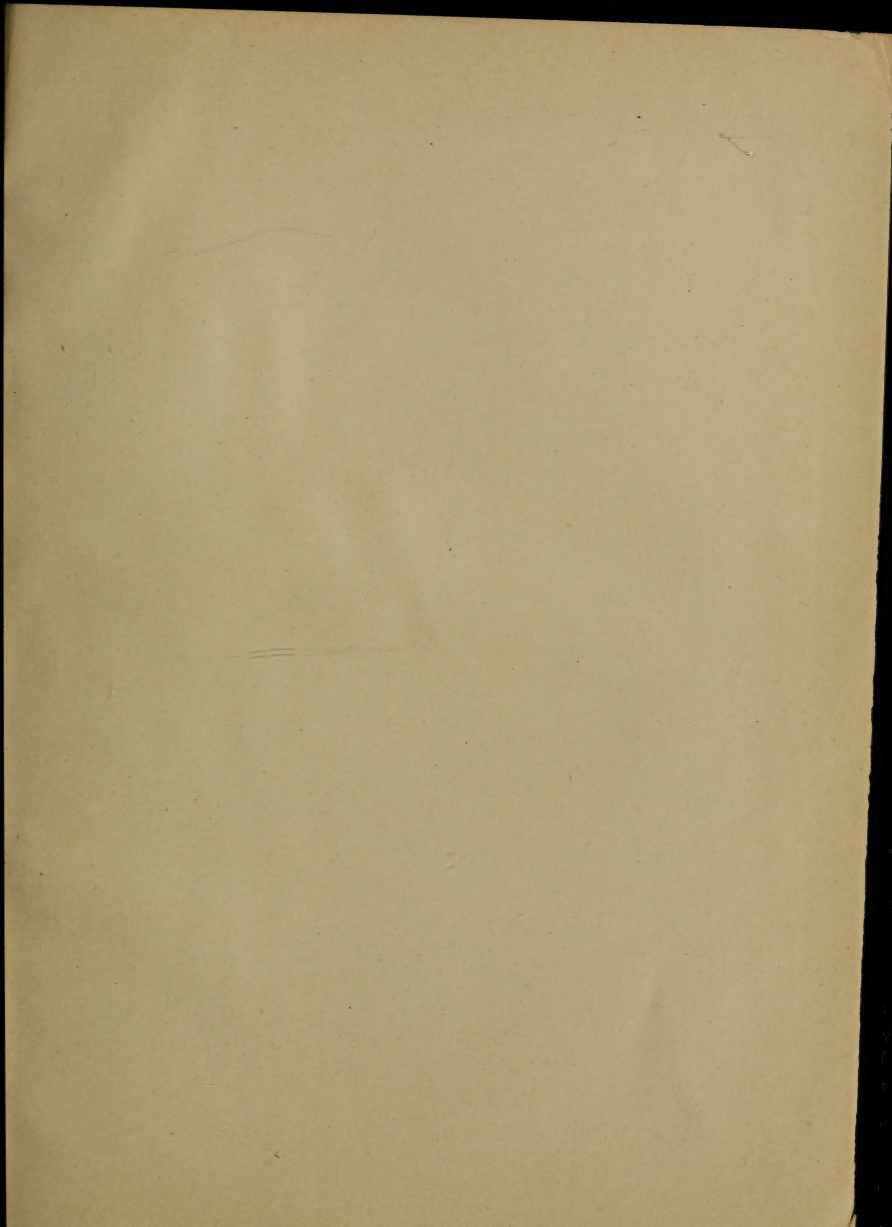
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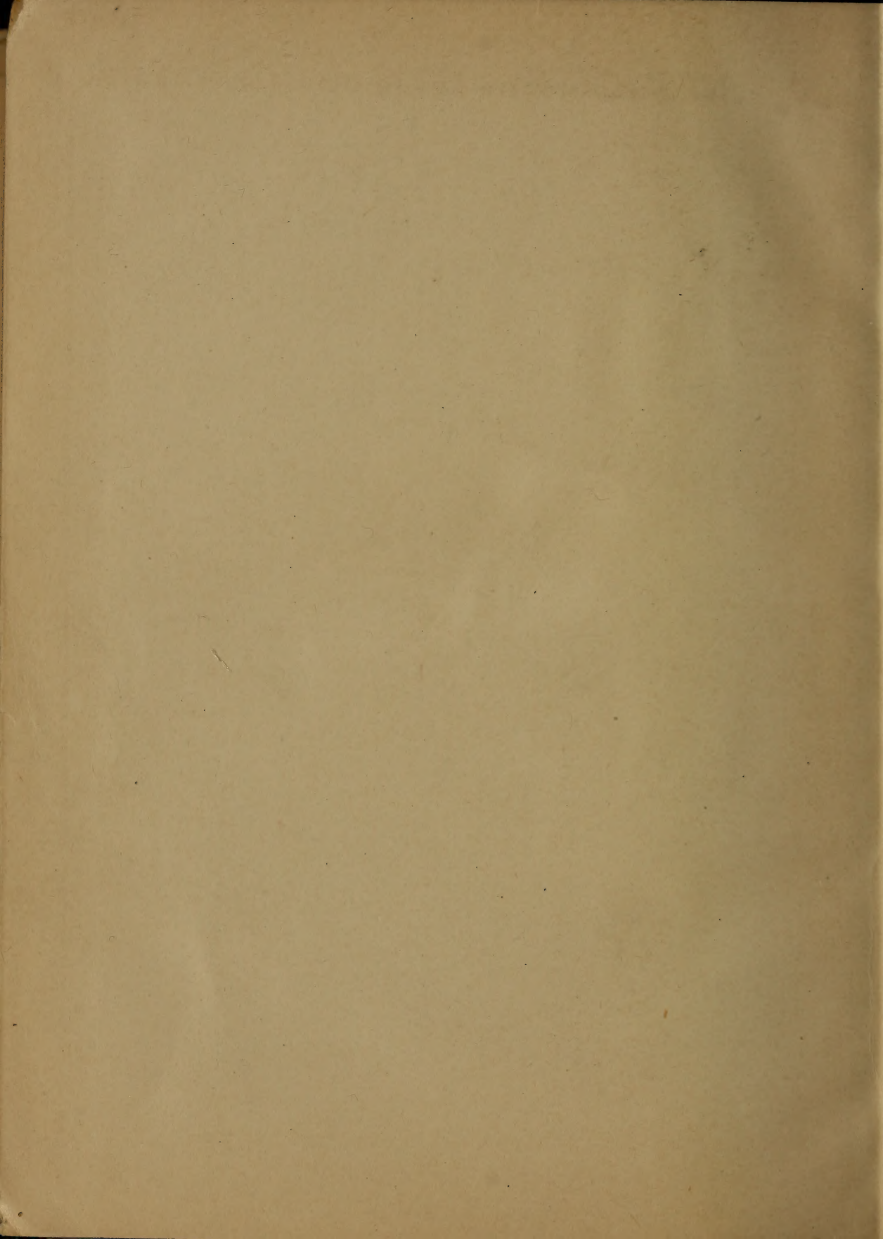
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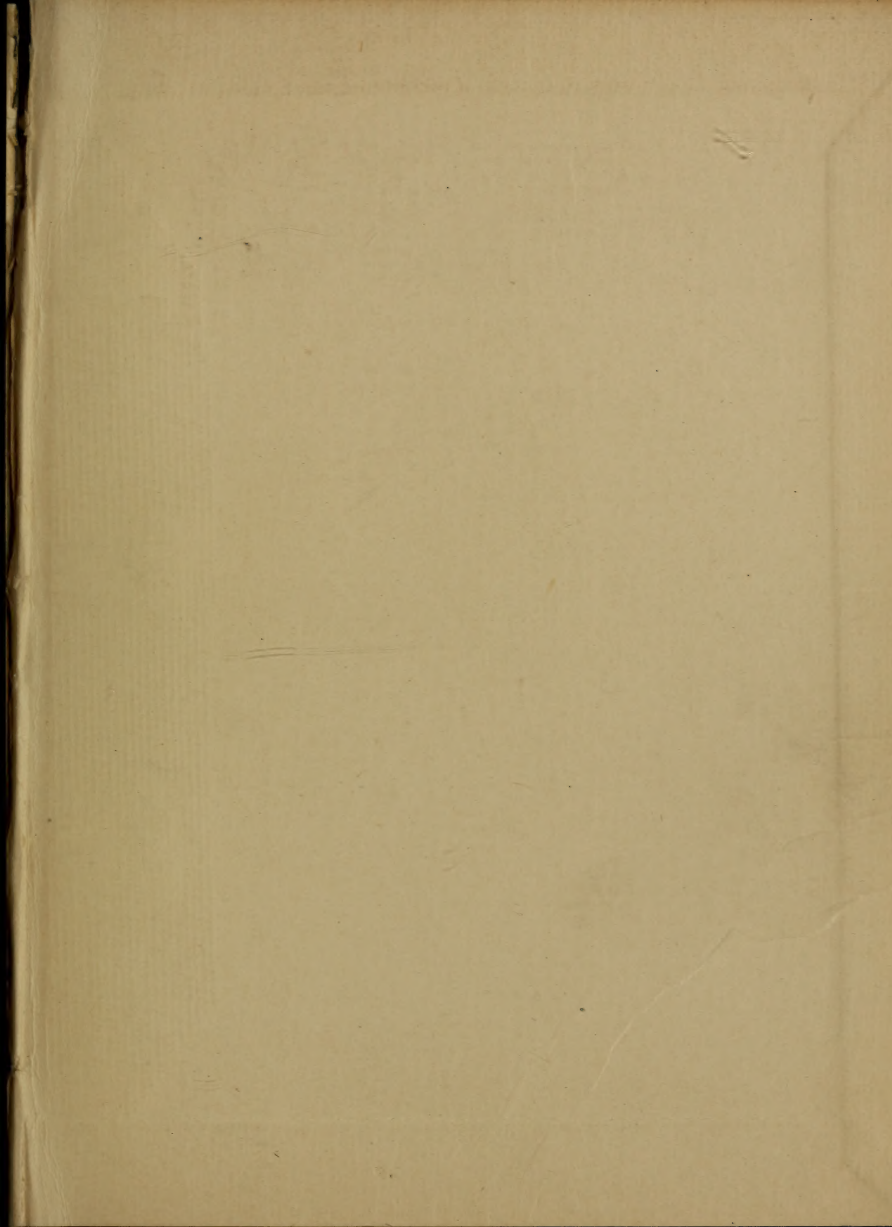












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